DOCUMENT RESUME

ED 465 138 CG 031 769

AUTHOR Schulenberg, John; Maggs, Jennifer L.
TITLE A Developmental Perspective on Alcohol and Other Drug Use during Adolescence and the Transition to Young Adulthood. Monitoring the Future Occasional Paper.
INSTITUTION Michigan Univ., Ann Arbor. Inst. for Social Research.
SPONS AGENCY National Inst. on Alcohol Abuse and Alcoholism (DHHS), Rockville, MD.; National Inst. on Drug Abuse (DHHS/PHS), Bethesda, MD.
REPORT NO ISR-OP-51
PUB DATE 2001-00-00
NOTE 78p.; Also funded by the Alcoholic Beverage Medical Research Foundation.
CONTRACT AA06324; DA01411; AA09143
AVAILABLE FROM Monitoring the Future, Inst. for Social Research, Univ. of Michigan, P.O. Box 1248, Ann Arbor, MI 48106.
PUB TYPE Information Analyses (070) -- Reports - Evaluative (142)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Adolescent Development; *College Students; *Developmental Stages; *Drinking; *Drug Use; Higher Education; Program Development; *Student Adjustment; Young Adults

ABSTRACT

This paper offers a developmental perspective on college drinking by focusing on broad developmental themes during adolescence and the transition to young adulthood. Heavy drinking increases during the transition to college, with significant interindividual variation in the course and consequences. The majority of young people make it through these years with, on balance, more positive than negative experiences with alcohol, but some experience tragic consequences and others develop chronic problems of abuse and dependence. The transition to college is a critical developmental transition, with major individual and contextual change in every domain of life leading to the potential for discontinuity and change in functioning and adjustment. Normative developmental transitions of adolescence and young adulthood are reviewed, focusing specifically on fundamental biological and cognitive changes; transitions of identity; changes in affiliations with the family of origin, peers, and romantic partners; and achievement transitions related to school and work. These transitions offer important vantage points for examining increasing (and decreasing) substance use and other health risks during adolescence and young adulthood. Final sections review research and policy implications, including broad implications for developmental interventions and more specific recommendations for alcohol-specific programming. (Contains 279 references, 3 tables, and 2 figures.) (Author/GCP)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 465 138

monitoring the future

occasional paper series

paper 51

A DEVELOPMENTAL PERSPECTIVE ON ALCOHOL AND OTHER DRUG USE DURING ADOLESCENCE AND THE TRANSITION TO YOUNG ADULTHOOD

John Schulenberg
Jennifer L. Maggs

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

J BACHMAN

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

CG031769

2

BEST COPY AVAILABLE

Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth

As its title suggests, this study is intended to assess the changing lifestyles, values, and preferences of American youth on a continuing basis. Each year since 1975 about 17,000 seniors have participated in the annual survey, which is conducted in some 130 high schools nationwide. In addition, subsamples of seniors from previously participating classes receive follow-up questionnaires by mail each year.

This Occasional Paper Series is intended to disseminate a variety of products from the study, including pre-publication (and somewhat more detailed) versions of journal articles, other substantive articles, and methodological papers.

A full listing of occasional papers and other study reports is available from Monitoring the Future, Institute for Social Research, The University of Michigan, P.O. Box 1248, Ann Arbor, MI 48106.

A DEVELOPMENTAL PERSPECTIVE ON ALCOHOL AND OTHER DRUG USE DURING ADOLESCENCE AND THE TRANSITION TO YOUNG ADULTHOOD

Monitoring the Future Occasional Paper 51

John Schulenberg
Jennifer L. Maggs[1]

Institute for Social Research
University of Michigan
Ann Arbor
2001

[1] University of Arizona

TABLE OF CONTENTS

List of Tables and Figures v

Acknowledgments vi

Abstract vii

Introduction 1

A Developmental Perspective on Adolescence and Young Adulthood 3

- Historical Perspective on Adolescent Development 3
- Developmental Conceptualizations 4

A Developmental Perspective on the Etiology of Substance Use During Adolescence and Young Adulthood 5

- Courses of Heavy Drinking 5
- Risk Factors for and Protective Factors Against Substance Use From a Developmental Perspective 7
  - Relationship Between Risk and Protective Factors 8
  - Equifinality and Multifinality 8
  - Robustness and Continuity of Risk and Protective Factors 9

Developmental Transitions and Substance Use During Adolescence and Young Adulthood 10

- Defining and Conceptualizing Developmental Transitions 11
  - Developmental Transitions, Tasks, and Trajectories 11
  - Discontinuity and Continuity 12
  - Distal and Proximal Developmental Influences 13
- Conceptual Models Relating Developmental Transitions to Substance Use 13
  - Overload Model 13
  - Developmental Mismatch Model 14
  - Increased Heterogeneity Model 15
  - Transition Catalyst Model 16
  - Heightened Vulnerability to Chance Events Model 16
  - Summary 17
- Fundamental Biological and Cognitive Changes 18
  - Pubertal/Physical Development 18

Physical Changes 18
Looking (and Desiring to Be) Older 19
Cognitive and Moral Development 19
Normative Changes 19
Invincible and Invulnerable? 20
Age-Related Changes in Alcohol Outcome Expectancies 20
Identification of Adult Hypocrisy 21
Identity Domain Transitions 21
Affiliation Domain Transitions 22
Family of Origin 22
Relationships with Parents 22
Sibling Influences 23
Transformations in Relationships with Peers 23
Romantic and Sexual Relationships 24
Achievement Domain Transitions 25
School Transitions 25
Work Transitions 27
Transition to College and the Five Conceptual Models 28
Implications for Research on Substance Use Etiology and Prevention 29
Program and Policy Implications Regarding College Drinking 30
Broader Developmental Intervention Implications 31
Developmental Transitions Represent Windows of Opportunity for Effecting Change 31
Facilitate Developmental Transitions 31
Intervene at Levels of Individual, Context, and/or Individual-Context Match 32
Content and Level of Interventions Should Be Developmentally Appropriate 32
Balance Increased Freedoms with Increased Responsibilities 33
Alcohol-Specific Programming Implications 34
Reduce Negative Consequences of Heavy Drinking 34
Target Interventions According to Likely Course of Heavy Drinking 34
Summary and Conclusions 35
References 37

LIST OF TABLES

Table 1 61

Table 2 62

Table 3 64

LIST OF FIGURES

Figure 1 69

Figure 2 70

ACKNOWLEDGMENTS

This occasional paper provides additional data for the article "A Developmental Perspective on Alcohol Use and Heavy Drinking During Adolescence and the Transition to Young Adulthood" printed in *Journal of Studies on Alcohol*.

Many of the ideas represented in this paper were derived from research funded by grants from the National Institute on Alcohol Abuse and Alcoholism (AA06324 and AA09143; PI: J. Schulenberg), and the Alcoholic Beverage Medical Research Foundation (PI: J. Maggs). Illustrative data used in this paper are from the Monitoring the Future project (funded by a grant from the National Institute on Drug Abuse [DA01411; PI: L. Johnston]). We wish to thank Patrick Johnson, Robert Zucker, and the other members of the Subcommittee Panel for their insightful and helpful comments on initial versions of this paper. We also wish to thank Jeffrey Jensen Arnett, Alison Bryant, and Deborah Safron for their perceptive suggestions, and also Tanya Hart, Virginia Laetz, and Amy Schulz for their editorial and production assistance.

ABSTRACT

This paper offers a developmental perspective on college drinking by focusing on broad developmental themes during adolescence and the transition to young adulthood. Heavy drinking increases during the transition to college, with significant interindividual variation in the course and consequences. The majority of young people make it through these years with, on balance, more positive than negative experiences with alcohol, but some experience tragic consequences and others develop chronic problems of abuse and dependence. The transition to college is a critical developmental transition, with major individual and contextual change in every domain of life leading to the potential for discontinuity and change in functioning and adjustment. A developmental perspective encourages the examination of alcohol use and heavy drinking in relation to normative developmental tasks and transitions and in the context of students' changing lives, focusing on a wide range of proximal and distal influences. Links between developmental transitions and health risks are discussed in light of five alternative models: Overload, Developmental Mismatch, Increased Heterogeneity, Transition Catalyst, and Heightened Vulnerability to Chance Events models. We review normative developmental transitions of adolescence and young adulthood, focusing specifically on fundamental biological and cognitive changes; transitions of identity; changes in affiliations with the family of origin, peers, and romantic partners; and achievement transitions related to school and work. These transitions offer important vantage points for examining increasing (and decreasing) substance use and other health risks during adolescence and young adulthood. Final sections review research and policy implications, including broad implications for developmental interventions and more specific recommendations for alcohol-specific programming.

INTRODUCTION

"I'm 21 and in my prime drinking years, and I intend to take full advantage of it!"

—College student, after a few drinks at a wedding

As researchers and practitioners who focus on alcohol use during adolescence and young adulthood, we may sometimes underestimate the clarity of young people's thinking about their alcohol use, as well as their ability to control their drinking. The large majority of older adolescents and young adults who drink fall into a category perhaps represented by the above-mentioned wedding guest. That is, they recognize this time in their lives as being one when drinking is common, largely acceptable, and often expected among their peers; they perceive some social and coping benefits of alcohol use and even occasional heavy drinking; they tend to limit their drinking such that it interferes little with their responsibilities (e.g., work, classes); and they also will diminish their heavy drinking as they move along in their lives. While they may experience some negative consequences with heavy drinking, most young people make it through their "prime drinking years" with, in balance, more positive experiences with alcohol than negative ones.

Of course, drinking becomes problematic and even tragic for many young people and for those around them. When viewed across the life span, heavy drinking, problems caused by drinking (e.g., physical and emotional distress, school and work difficulties), and alcohol-related risky behaviors and illegal activities (e.g., alcohol-related traffic and other accidents, unprotected sexual activity, violence) peak during late adolescence and early adulthood (Baer, 1993; Hilton, 1991; Fillmore, Johnstone, Leino, & Ager, 1993; Johnston, O'Malley, & Bachman, 1999; Wilsnack, Wilsnack, & Klassen, 1984), as do problems with substance abuse in general (e.g., Glantz, Weinberg, Miner, & Colliver, 1999; Johnston et al., 1999). This period in life is an important juncture in the etiology of adult alcohol abuse and alcoholism, a time when initiation and escalation of heavy drinking may set the stage for lifelong difficulties with alcohol (e.g., Babor et al., 1992; Cloninger, 1987; Zucker, 1987). Even without invoking the potential for a long-term course of alcohol abuse and alcoholism, alcohol use during this period can also be dangerous. Heavy drinking combined with a momentary lapse in good judgment or with simple misfortune can set the stage for a life-altering tragedy.

Recognizing how drinking fits into young people's lives is a necessary foundation for effective remedies to counter the dangers of alcohol use and heavy drinking. It is indisputable that in the United States (and many, but certainly not all, other countries; e.g., see Fillmore et al., 1993), alcohol use and especially heavy drinking are culturally embedded in the experience of adolescence and the transition to young adulthood in general (Blane, 1979; Donovan, Jessor, & Jessor, 1983), and in the college experience in particular (Straus & Bacon, 1953; Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998). Among the nation's high school seniors, three-quarters report alcohol use in the past 12 months, over half report use in the past 30 days, and nearly a third report binge drinking (i.e., 5 or more drinks in a row) in the past two weeks (Johnston et al., 1999). During the high school years, college-bound students as a group have *lower* rates of alcohol and other drug use than their noncollege bound classmates; but in the years immediately following high school, college students have *higher* rates of alcohol use and binge drinking (but still lower rates of other

substances) than their noncollege age-mates (Johnston et al., 1999; Schulenberg, Bachman, O'Malley, & Johnston, 1994).

Perhaps most indicative of the embeddedness of heavy drinking in the transition from adolescence to young adulthood in the U.S. is the remarkable historical stability of binge drinking rates across recent years. During the past two decades, despite all the various social, demographic, political, and economic changes that have taken place, and despite dramatic shifts in rates of illicit drug use and cigarette use, the 1980-1998 rates of binge drinking among those aged 19-22 have shifted little (i.e., average two-week prevalence rate of 39 percent, +/- 4 percentage points), especially among college students (i.e., average two-week prevalence rate of 42 percent, +/- 3 percentage points) (Johnston et al., 1999; see also O'Malley & Johnston, in press). This relative imperviousness of binge drinking to historical change, and in particular to the many national, regional, and local efforts to reduce alcohol use and misuse among adolescents and college students over the past two decades, indicates that heavy drinking during the transition to young adulthood and especially college may be "overdetermined" (see also Wechsler et al., 1998). This is not to justify heavy drinking among young people nor to convey pessimism about the likelihood of success for future interventions, but rather to underscore that a multitude of forces at the cultural and individual levels keep this phenomenon in place. And, as we will discuss later in this paper, many young people obviously are immune to such forces, avoiding heavy drinking or even alcohol use altogether.

Our purpose in the present paper is to address the question of how alcohol use and heavy drinking fit into young people's lives from a developmental perspective by examining the various developmental tasks and transitions of adolescence and young adulthood and considering how they relate to the course of alcohol use and heavy drinking. We start with brief discussions regarding the meaning and importance of taking a developmental perspective on adolescence and young adulthood, as well as regarding the etiology of alcohol use during this time. In these initial sections, we consider a number of conceptual and practical issues as they relate to stability and change over time, to individual differences and similarities, to the interplay of individual developmental needs and contextual affordances, and to risk and protective factors. We then focus extensively on how developmental transitions relate to alcohol use, beginning with a consideration of broader conceptual models that link transitions with health risks, and followed by a selective summary of the content of normative developmental transitions during adolescence and young adulthood, supported by empirical literature showing how these may be related to alcohol use and heavy drinking. Given the wealth of relevant topics and literature, our strategy is to be illustrative rather than comprehensive. This strategy will permit us to highlight the necessity and advantages of taking a developmental perspective on alcohol and other drug use etiology and intervention. We conclude this paper with a discussion of research, intervention, and policy implications.

A DEVELOPMENTAL PERSPECTIVE ON ADOLESCENCE AND YOUNG ADULTHOOD

Historical Perspective on Adolescent Development

G. Stanley Hall, considered to be the founder of the scientific study of adolescence (Arnett, 1999; Muuss, 1996), gave us the enduring image of adolescence as a time of unavoidable "storm and stress." Hall's biogenetic theory of adolescence was built upon the recapitulation theory of evolution, in which individual development (ontogeny) recapitulates species development (phylogeny), with adolescence reflecting the turbulent transition in human history from savagery to civilization (Hall, 1904; Muuss, 1996). The adolescent that the field inherited from Hall is a troubled and troubling soul, given to rapid mood swings, desperate for a leader yet reactive against all authority, and constantly torn between such desires as passion and fidelity, conceit and humility. As Arnett (1999) notes, Hall certainly did recognize individual differences as well as cultural variation in the experience of storm and stress. Nevertheless, as Hall tells us, little can be done to ease adolescents' pain (and the pain they cause others), because development is largely controlled by evolution and biology and thus generally unaffected by culture or context. That is, adolescence is seen as "just a stage," and when it passes, civility and mental health will return. A century later, despite the wealth of evidence against Hall's views about recapitulation and biological determinism, his mythical image of the inherently turbulent adolescent is still strongly reflected in popular culture and sometimes in the scientific literature.

Hall was hardly alone in his beliefs on this subject. Most prominently, Sigmund Freud's psychoanalytic theory viewed turmoil as an unavoidable and even essential component of adolescence. According to Freud's theory, puberty brings on the genital stage of psychosexual development, during which the strengthening of sexual desire and the necessity of severing emotional dependence on parents lead to inner and interpersonal turmoil (A. Freud, 1958). Indeed, in elaborating on her father's theory, Anna Freud (1958) argued that the *lack* of adolescent storm and stress signified psychopathology. Other psychoanalytic theorists (e.g., Blos, 1970; Erikson, 1950; Sullivan, 1947) also highlighted the inevitability of adolescent turmoil, although emphasizing different causes.

In addition to these organismic and psychoanalytic roots of current images of adolescence, there are mechanistic and contextual roots (cf. Pepper, 1942; Lerner & Kauffman, 1985). Margaret Mead (1950) and Ruth Benedict (1950) argued that "storm and stress" is primarily a cultural phenomenon due to the discontinuity in roles and responsibilities between childhood and adulthood in modern societies (see also Schlegel & Barry, 1991). Kurt Lewin (1939) attributed adolescent difficulties to adolescents' ambiguous life space rather than to their individual characteristics. Robert Havighurst (1952) identified culturally defined developmental tasks that individuals needed to accomplish during certain age ranges. He viewed difficulties that arose during adolescence in terms of inability or unwillingness to accomplish the necessary tasks.

While diversity in present-day scientific images of adolescence remains (Arnett, 1999), reflecting strong roots in both biology and culture, the notion that adolescence is *necessarily* a time of storm and stress has received little empirical support (e.g., Douvan & Adelson, 1966; Offer, Ostrov, & Howard, 1981; Rutter, Graham, Chadwick, & Yule, 1976;

Schlegel & Barry, 1991). Notions of developmental stages and biological and social imperatives have given way to probabilistic conceptualizations of person-context interactions (Lerner & Kauffman, 1985; Magnusson & Cairns, 1996; Sameroff, 1995; Wachs, 2000). Consistent with life span and ecological perspectives on human development (e.g., Baltes, 1987; Bronfenbrenner, 1979; Elder, 1998; Featherman, 1983; Lerner & Busch-Rossnagel, 1981; Schaie, 1965), a typical answer now to any question about the impact of some characteristic or event on adolescent development is that it depends on the individual, the context, and the interaction between the two. A common current view, and one consistent with our own perspective, is ". . .adolescence is characterized by change, and is challenging, but it need not be tumultuous and problematic unless societal conditions prompt it" (Petersen & Leffert, 1995, p. 3).

Developmental Conceptualizations

There is not one unified agreed-upon theory or conceptual framework for understanding and studying human development. Indeed, developmental scientists often disagree about the very meaning of development, and this disagreement stems from differences in philosophical assumptions about humans and our nature and nurture (Lerner & Kauffman, 1985; Reese & Overton, 1970). The developmental perspective we offer in this paper is consistent with a developmental-contextual framework that emphasizes multidimensional and multidirectional development across the life span, with stability and change occurring as a function of the dynamic interaction between active/reactive individuals and their active/reactive contexts (e.g., Baltes, 1987; Lerner & Kauffman, 1985; Sameroff, 1987; Zucker, 2000; Zucker, Fitzgerald, & Moses, 1995). Individuals are embedded in an ecological niche, and thus while genetic and other organismic factors certainly play a primary role in development, they do so in conjunction with contextual forces.

To help envision contextual influences and person-context interactions on development, Bronfenbrenner (1979) offered an ecology of human development framework that involves nested, interconnected systems to represent the structure of the social context. The developing individual's primary contexts, or microsystems, include, for example, his/her family, peer group, school, and work. Interrelations among microsystems, termed mesosystems, are extremely important, in that harmonious ties among microsystems (e.g., in terms of supporting common goals for the developing individual) are generally viewed as beneficial for individuals. Additional context systems in this framework include exosystems (i.e., influential contexts that do not contain the developing individual, such as the child's parents' work settings) and macrosystems (i.e., broader cultural and historical influences) in which all the other systems are embedded.

Central to our goal of linking developmental transitions with alcohol use is Bronfenbrenner's notion of ecological transitions. Bronfenbrenner (1979) defines an ecological transition as occurring "whenever a person's position in the ecological environment is altered as a result of a change in role, setting, or both" (p. 26). Ecological transitions typically involve changes not only at the individual and microsystem levels, but also at the mesosystem level. As a result of a given transition, new and recurring microsystems may become more or less aligned, which in turn has implications for the developing individual's health and well-being. Furthermore, links between pre-transitional microsystems (e.g., high school) and new microsystems (e.g., college) can be viewed as

mesosystems as well, suggesting the importance of contextual influences on successful adaptation during developmental transitions.

This emphasis on ecological transitions highlights developmentally proximal influences on behavior, setting the foundation for considerations of turning points and developmental discontinuity (Elder, 1998; Rutter, 1996). This is not to downplay the importance of developmentally distal influences or of the successive and continuous components of development. Indeed, defining features of any developmental perspective include a focus on the influence of earlier experiences on later ones as well as on continuities across time. In taking a developmental-contextual perspective, the focus is on the interconnections between developmentally distal and proximal influences, and between developmental continuities and discontinuities across the life span. Furthermore, following from the emphasis on person-context interactions in this perspective, considerations of interindividual similarities and differences in intraindividual change are essential, with less emphasis on normative trends in developmental change and more emphasis on different trajectories of change over time.

As we illustrate throughout this paper, key developmental themes, including person-context interactions, stability and change, distal and proximal influences, and individual differences and similarities in intra-individual change, represent important foundations for understanding how substance use fits into young people's lives. In the next section, we briefly consider the etiology of alcohol use and heavy drinking from a developmental perspective.

A DEVELOPMENTAL PERSPECTIVE ON THE ETIOLOGY OF SUBSTANCE USE DURING ADOLESCENCE AND YOUNG ADULTHOOD

Here we offer only a brief discussion of some key developmental themes as they relate to the courses of and risk factors for alcohol use and heavy drinking (see also Schulenberg, Maggs, Steinman, & Zucker, 2000).

Courses of Heavy Drinking

Do colleges "inherit" their problems with drinking from high schools? It is true that most young people drink long before they even apply to college, but when it comes to heavy drinking, it is clear that there is rapid escalation during the first and second years of college (Johnston et al., 1999). Based on nationally representative panel data drawn from the Monitoring the Future project, Figure 1 shows the rates of binge drinking (i.e., 5 or more drinks in a row in the last two weeks) between ages 18 and 24 by four-year college student status (Schulenberg, 1999). As shown, binge drinking increases rapidly between the senior year of high school (wave 1) and the first and second year of college for four-year college students (wave 2). For noncollege young adults, binge drinking begins to decline after high school, and it is not until age 23/24 (wave 4) that the rates for these two groups converge.

When considering the etiology of heavy drinking during adolescence, and especially the transition to young adulthood, it is essential to examine different trajectories of drinking over time; otherwise, one may be misled by the normative developmental trend and fail to appreciate the wide diversity of patterns of change in heavy drinking over time (e.g., Bates &

Labouvie, 1997; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996; Schulenberg, Wadsworth, O'Malley, Bachman, & Johnston, 1996; Zucker, 2000). Based again on the Monitoring the Future data, Schulenberg, O'Malley et al. (1996) focused on distinct trajectories of change in binge drinking across four waves during the transition to young adulthood (ages 18-24). Using conceptual groupings and cluster analysis, they found six trajectories of binge drinking: (1) Chronic (i.e., at least 2 or more binge drinking episodes in the last two weeks across all 4 waves); (2) Decreased (i.e., started like the Chronic group in high school, and then decreased their binge drinking across the 4 waves); (3) Increased (i.e., very little binge drinking in high school, and then increased across the 4 waves, catching up to the Chronic group); (4) Fling (i.e., very little binge drinking in high school followed by a rapid increase then decrease across the 4 waves); (5) Rare (i.e., very little binge drinking across the 4 waves); and (6) Never (i.e., no binge drinking across the 4 waves). (About 10 percent of the sample did not fit any of these groups.) The mean binge drinking scores for these trajectory groups (except for the Never group, representing 36 percent of the sample) are illustrated in Figure 2. Note the discrepancy between what we can learn about the course of binge drinking from the "total" line illustration versus. from the trajectory group lines illustration.

In addition to diversity in the individual trajectories of binge drinking during the transition, there are important differences in the prevalence of the different trajectory groups according to such factors as gender, ethnicity, and college student status (Schulenberg, O'Malley et al., 1996; Schulenberg, 1999). For example, compared to men, women are under-represented in the Chronic and Increased groups, and over-represented in the Never group. Compared to most ethnic minority youths, white youths are over-represented in all binge drinking groups except the Never group. Compared to their noncollege age-mates, college students are over-represented in the Increased and Fling groups and under-represented in the Decreased group. Consistent with other research from the Monitoring the Future project (e.g., Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997), prevalence rates of the trajectory groups among college students varied by living arrangements (e.g., living with parents, living away at college) and fraternity/sorority membership. For example, compared to students who lived at home, those who lived away from home and were active in fraternities or sororities were over-represented in the Chronic, Increased, and Fling groups and under-represented in the Never group; those who lived away from home but were not active in the Greek system had prevalence rates between the Greek and commuter students (Schulenberg, 1999).

Another key reason to be concerned with differential change in alcohol use over time is that a given level of use at one point in time could represent a number of different trajectories, with some being far more troublesome than others. Frequent binge drinking during the first few years of college may reflect continuity of a pattern established in high school (the Chronic group), or it may reflect a newly emergent, time-limited pattern. Similarly, as Weber, Graham, Hansen, and Flay (1989) found among two groups of high school students with similarly high levels of substance use, one group had a prior lengthy history of persistent and severe difficulties, while the other group had only recent and moderate behavioral difficulties. In these examples, which illustrate the concept of equifinality (discussed in next section), the different trajectories that lead to similar endpoints reflect substantially different antecedent difficulties which are likely to have different implications for future difficulties and possible remedies (Zucker et al., 1995). Likewise,

frequent binge drinking during the first few years of college may or may not reflect a future escalating trajectory that will continue into young adulthood (illustrating the concept of multifinality that is discussed in the next section). While many young people who misuse substances are likely to experience ongoing misuse extending into adulthood, most others exhibit patterns of misuse that will subside with the onset of adulthood roles (Bachman et al., 1997; Jessor, Donovan, & Costa, 1991). Again, these two distinct trajectories of use stemming from a similar initial level will have different implications regarding future difficulties and possible remedies.

Heavy alcohol use and problems with alcohol tend to peak in the early to mid-20s, and then subside as young people move into adulthood roles. In many ways, this normative shift in alcohol use is quite remarkable. In a matter of a few short years, the excessive drinking and concomitant negative consequences experienced by many youth that would likely reflect diagnosable alcohol abuse (and often alcohol dependence) at other points in the life span, simply run their course and stop. Clearly, as we have just shown, there are wide interindividual differences in the course of heavy drinking, and among the majority of young people who do engage in some heavy drinking, cessation patterns and timing vary considerably. Still, the rather uniform decline in alcohol use for the large majority of young heavy drinkers speaks as much to the culture of late adolescence as it does the culture of adulthood. While there may be some symmetry in explanatory processes for the escalation and decline of heavy drinking during late adolescence and young adulthood (e.g., normative increases and decreases in risk taking), there are also asymmetrical explanatory processes. In particular, the normative decline appears to be tightly connected to the assumption of traditional adulthood roles, particularly marriage, and to a lesser extent, full time employment and parenthood (Bachman et al., 1997).

Risk Factors for and Protective Factors Against Substance Use From a Developmental Perspective

A more developmentally sensitive understanding of risk and protective factors will provide a stronger foundation for addressing fundamental questions about substance use etiology and intervention (Clayton, 1992). Much effort over the past few decades has gone into identifying and cataloguing risk and protective factors, and these successful efforts have yielded a large and sometimes overwhelming array of relevant individual and contextual factors (e.g., Chassin, 1984; Elliott, Huizinga, & Menard, 1989; Hawkins, Catalano, & Miller, 1992; Petraitis, Flay, & Miller, 1995; Scales & Leffert, 1999). Identifying and cataloguing the salient dimensions and constructs is an essential initial phase in the scientific process (Pepper, 1942). In the case of theory and research regarding substance use, it is likely that the great majority of potential psychosocial risk and protective factors have been identified, and that the field needs to continue to move to the next phase, which is specifying the processes that link risk and protective factors with substance use within individuals over time and across contexts. In this section, we focus on three issues that are of particular concern when considering how risk and protective factors interrelate among themselves and relate to substance use.

Relationship Between Risk and Protective Factors

It is common to view risk and protective factors as opposite ends of the same continuum. For example, doing poorly in school is a risk factor for substance use, and doing well in school is a protective factor against substance use. An alternative approach is to consider how protective factors may moderate or buffer the effects of risk factors (Brook, Cohen, Whiteman, & Gordon, 1992; Garmezy, Masten, & Tellegen, 1984; Hawkins et al., 1992; Johnson & Johnson, 1999; Rutter, 1990). According to this approach, protective factors operate only in the presence of other risk factors whose effects they moderate. A supportive family environment, for example, might have a protective effect only in the presence of peer influences to use drugs. Without such peer influences, family environment may have no effect on an adolescent's propensity to use drugs, in part because drug use is so unlikely (Oetting & Beauvais, 1986). Protective factors also may operate by reducing the likelihood of other risk factors (i.e., the effect of protective factors is mediated by the risk factors). Thus, for example, a supportive family environment may also reduce the presence of negative peer influences by influencing an adolescent's choice of friends.

Equifinality and Multifinality

Longitudinal panel studies from early childhood to young adulthood suggest that some risk and protective factors first appear during childhood or earlier, well before the onset of any substance use. While such factors as early antisocial behavior or genetic susceptibility to substance use increase one's vulnerability to negative outcomes, they do not necessarily doom a child to a life of inebriation and failure (O'Connor & Rutter, 1996). Indeed, one of the most compelling reasons for longitudinal studies on substance use is to identify why great numbers of individuals do not develop serious substance abuse problems despite exposure to significant risk factors, and likewise why many individuals do develop problems despite little exposure to risk factors (Cicchetti, 1999; Rutter, 1989; Zucker, 2000). The concepts of equifinality and multifinality, as introduced earlier, are of particular importance in this regard (e.g., Cicchetti & Rogosch, 1996; Gottlieb, 1991). When considering how risk and protective factors might contribute to substance use, several different types of risk/protective factors can lead to the same outcome (i.e., equifinality), and any given risk or protective factor can lead to a multitude of different outcomes (i.e., multifinality).

For example, with regard to equifinality, among youth with high levels of binge drinking in high school, two likely antecedent pathways are represented by those with an early and enduring history of substance abuse and those who just began drinking heavily in high school (e.g., Steinman & Schulenberg, 1999; Weber et al., 1989). Each of these histories reflects different developmental trajectories that involve two distinct constellations of risk and protective factors (e.g., Loeber, 1982; Moffitt, 1993). The differential antecedents of high levels of substance use during late adolescence may reflect certain personality characteristics and/or school difficulties and/or family difficulties and/or involvement with deviant peers (or none of the above).

With regard to multifinality, a given risk factor (school difficulties) does not necessarily contribute to substance use, and indeed, certain risk factors can also serve as protective factors for some individuals in some circumstances (Rutter, 1996; Zucker, 2000). A prime example of this is parental alcoholism, which can serve as a risk factor for some and

protective factor for others: children of alcoholics (COAs) are at heightened risk of experiencing alcohol abuse and dependence due to genetic and socialization mechanisms (e.g., Russell, 1990; Sher, 1991; Windle & Searles, 1990); nevertheless, COAs also have a higher-than-average chance of becoming abstainers.

These concepts and examples highlight the probabilistic nature of risk and protective factors. Among the many identified potential risk and protective factors, none is sufficient or necessary for particular outcomes, thus requiring conceptualizations of explanatory processes that focus on the diversity of causal connections (Cairns, Cairns, Rodkin, & Xie, 1998; Cloninger, Svrakic, & Svrakic, 1997; Magnusson, 1997; Newcomb, 1997; Schulenberg et al., 2001; Wachs, 2000).

Robustness and Continuity of Risk and Protective Factors

Very few (if any) risk or protective factors can be viewed as being universal in the sense that they apply equally to all individuals. Clearly, the effect of and processes associated with risk and protective factors vary by important demographic and biological characteristics, such as gender (e.g., Hops, Davis, & Lewin, 1999; Wilsnack, 1995; Windle & Barnes, 1988). Likewise, very few (if any) risk or protective factors can be viewed as being developmentally continuous in their relationships with substance use. In particular, risk factors for the onset of alcohol and other drug use may be quite different from risk factors for the maintenance and escalation of alcohol and other drug use (e.g., Ellickson & Hays, 1991; Hesselbrock, O'Brien, Weinstein, & Carter-Menendez, 1987; Newcomb, 1997; Schulenberg, Wadsworth et al., 1996).

Risk and protective factors can be grouped according to whether they are *robust* (i.e., predict current levels of and future changes in substance use), *emergent* (i.e., predict future changes in, but not current levels of, substance use), or *concurrent* (i.e., predict current levels of, but not changes in, substance use). For example, Schulenberg, Wadsworth et al. (1996) found that gender (male) and the drinking motivation of "to get drunk" at age 18 were robust risk factors because both predicted current binge drinking as well as increased binge drinking during the transition to young adulthood. In addition, they found that self-efficacy at age 18 was an emergent protective factor because while it did not predict current binge drinking, it did predict less drinking during the transition to young adulthood.

Compared to robust and emergent risk/protective factors, concurrent ones are far more common, not surprising given the difficulties of predicting change over time and the fact that risk and protective factors also change over time. Indeed, in longitudinal studies of substance use spanning the transition to young adulthood, most risk and protective factors are found to be only concurrent (e.g., Bates & Labouvie, 1997; Gore, Aseltine, Colten, & Lin, 1997; Schulenberg, Wadsworth et al., 1996). It is important to distinguish among different types of concurrent risk and protective factors. *Moving concurrent* risk/protective factors change in unison with changes in substance use and reflect the continuous association of these variables (e.g., Kandel & Ravies, 1989). For example, Schulenberg, Wadsworth et al. (1996) found that risk-taking is a moving concurrent risk factor for binge drinking during the transition to young adulthood; i.e., risk-taking is related to binge drinking throughout adolescence and young adulthood. *Developmentally limited* risk and protective factors either cease to change or change independently from substance use. That is, they are of importance

for only a limited time period. In the Schulenberg, Wadsworth et al. (1996) study, for example, overt hostility was associated with binge drinking in high school but not during young adulthood, suggesting some discontinuity in the web of influences related to this behavior.

Concurrent risk/protective factors can be ambiguous in regard to causal relations with substance use. Concurrent risk/protective factors may represent more developmentally or contextually proximal influences, perhaps mediating the effects of early more distal influences (cf. MacKinnon, 1994; Patterson, DeBaryshe, & Ramsey, 1989; Petraitis et al., 1995; Wills, Pierce, & Evans, 1996). Oetting and Beauvais (1986), for example, argue that virtually all risk factors for substance use operate by increasing an adolescent's likelihood of participating in a group of substance-using peers. Thus, more distal influences such as feeling alienated or suffering from an unsupportive family environment may only increase substance use to the extent that they lead individuals to join and actively participate in peer groups that use drugs. In addition, a constellation of risk and protective factors that move together over time with substance use also may reflect the reciprocal nature of their relationships.

DEVELOPMENTAL TRANSITIONS AND SUBSTANCE USE DURING ADOLESCENCE AND YOUNG ADULTHOOD

The passage from adolescence into young adulthood is a critical developmental transition during which diversity in life trajectories increases (Schulenberg, O'Malley, Bachman, & Johnston, 2000; Sherrod, Haggerty, & Featherman, 1993). For many adolescents, this period begins when they move away from their parents' home to begin college and live in student residences. This critical developmental transition represents the co-occurrence of at least two major role changes: the transformation from being a high school student to a university student, and from being a child living at home to an independent person living in a college dormitory. As with other developmental advances and role transformations, the transition to university life involves both gains and losses (Baltes, 1987; Cantor & Langston, 1989), such as the initiation of new roles (e.g., roommate) but the end of others (e.g., high school student); new friendship networks, but separation from family and old friends; more academic choices and opportunities (e.g., different courses, areas of specialization) but corresponding new academic demands (e.g., much larger classes, less direction from instructors, increased competition); and increased independence and self-direction, but decreased parental guidance and support (Maggs, 1997). Amidst all these "moving targets," alcohol use and heavy drinking tend to escalate, a co-occurrence that is far more than coincidental.

In this section, we address this co-occurrence by examining how the various developmental transitions during adolescence and young adulthood relate to substance use. Developmental transitions of interest during adolescence and young adulthood can be grouped into the following: (1) fundamental changes of pubertal and cognitive development, (2) identity transitions (e.g., changes in self-definition, increased self-regulation); (3) affiliative transitions (e.g., changes in relationships with parents, peers, and romantic partners), and (4) achievement transitions (e.g., school and work transitions) (Schulenberg, Maggs, & Hurrelmann, 1997a). These four domains of transitions, and how they relate to alcohol and other drug use, will be discussed in detail later in this section. To set the stage, we first consider definitional and conceptual issues regarding developmental transitions, and

then examine five conceptual models concerning the link between developmental transitions and health risks.

Defining and Conceptualizing Developmental Transitions

Developmental transitions are "the paths that connect us to transformed physical, mental, and social selves" (Schulenberg, Maggs, & Hurrelmann, 1997b, p. 1). Puberty represents an obvious major developmental transition, as do moving from high school to college, from school to work, and from being single to getting married. There are many other developmental transitions that are more subtle yet still distinct: a young adolescent who usually does what she is told begins to argue persuasively against her parents' directives; a small same-sex group of friends becomes folded into a larger group made up of boys and girls, which in turn is replaced by individual friendships and dating relationships; and a concrete and typically unquestioned self-definition becomes more abstract and tentative, and eventually more hierarchic and future-oriented. Together, these and the many other developmental transitions during the second and third decades of life provide the structure that transforms children into adolescents and adolescents into young adults.

The occurrence and meaning of developmental transitions originate in the interaction of physical maturational processes, cultural influences and expectations, and personal values and goals. Individuals shape their own developmental transitions to some degree, as they act on and are acted upon by the social and physical environment (e.g., Gottlieb, 1991; Lerner, 1982; Scarr & McCartney, 1983). As with other developmental processes, these transitions are embedded in a socio-cultural context and therefore may vary by gender, class, culture, and historical period. Culturally based, age-related expectations, or "scripts," shape developmental transitions in that they provide a normative social timetable and agenda for role transitions (e.g., employment, parenthood) (Neugarten, 1979). Developmental transitions can be normative or non-normative, depending on their prevalence within a given population, as well as on their timing (Baltes, 1987). There are also significant inter-individual variations in the order and importance of the various transitions, depending on personal goals and life situations (e.g., Nurmi, 1993, 1997).

Developmental Transitions, Tasks, and Trajectories

It is important to distinguish between developmental transitions and developmental tasks. Developmental tasks (Havighurst, 1952; Oerter, 1986) are socially and biologically prescribed psychosocial tasks that "should" be accomplished during specific sensitive periods across the life span. While tasks and transitions are clearly related, and sometimes even overlapping (e.g., the task of selecting a mate versus the transition to marriage), transitions pertain more to the actual process of change than to the accomplishments that contribute to and result from the changes.

It is also important to distinguish developmental transitions from developmental pathways or trajectories (cf. Cairns & Cairns, 1994; Crockett & Crouter, 1995). Developmental trajectories refer to patterns of systematic and successive change over time and might incorporate several developmental transitions for a given individual or group of individuals (Elder, 1998). An emphasis on trajectories represents a powerful approach to

understanding the path of individual change over time, providing a needed alternative to more normative change approaches. Nevertheless, as Steinberg (1995) argues, a strong emphasis on developmental trajectories may serve to overestimate continuity in functioning over time. In contrast, an emphasis on individual developmental transitions focuses consideration on both continuity and discontinuity in functioning over time. By viewing transitions as embedded in ongoing individual trajectories, it is possible to consider transitions as potential turning points reflecting significant increases or decreases in functioning, as well as the connections between different transitions in a successive manner (e.g., success in negotiating the transition from junior high to high school as setting the stage for likely success in negotiating the transition into college) (Elder, 1998; Rutter, 1996).

Discontinuity and Continuity

Common to all developmental transitions is the element of discontinuity. Although the discontinuity is neither necessarily abrupt nor unequivocal, it is clear that each transition involves some change in how we experience ourselves and our world, in how others experience us, and typically in our social and physical contexts. As discussed later in this section, such changes may engender risks or benefits to health and well-being.

Developmental transitions are also characterized by continuity. Continuity in functioning and adjustment across developmental transitions occurs for numerous reasons, including the stability of physical, temperamental, and personality characteristics, as well as stability of many features of one's context (e.g., parents, friends, neighborhoods). One of the best predictors of future adjustment is past adjustment, and health over the life span tends to follow a specific trajectory reflecting continuity (e.g., Susman, Dorn, Feagans, & Ray, 1992). Obviously, this continuity can be either salutary or detrimental to health. The challenge lies in discovering how to influence developmental transitions such that continuity occurs in health-enhancing behaviors and discontinuity in health-compromising behaviors.

Issues of continuity and discontinuity are complex, and in many ways, central to understanding the power of major developmental transitions on individuals' lives (Petersen, 1993; Rutter, 1996). For instance, any apparent discontinuity in functioning across a major developmental transition may simply reflect a momentary disturbance, after which one's ongoing trajectory of functioning will quickly be resumed. Likewise, change in functioning during a transition that may seem to reflect discontinuity may actually represent the continuity of adaptation—that is, phenotypic discontinuity may reflect genotypic continuity (Zucker, 2000).

But consistent with a developmental–contextual perspective, and particularly with the notion of ecological transitions (Bronfenbrenner, 1979), we argue that major developmental transitions, such as the transition into college, can and do permanently alter one's ongoing trajectory of health and well-being. Indeed, major developmental transitions can be viewed as catalysts or even primary mechanisms for the multifinality of earlier experiences and events. For example, although the majority of individuals mature out of their heavy drinking patterns by the end of the transition to young adulthood (Bachman et al., 1997), an important minority continue with high levels of alcohol consumption and increasing alcohol-related problems. It generally has been difficult to identify pre-transitional characteristics that differentiate these two groups (e.g., Baer, 1993; Blane, 1979; Windle & Davies, 1999;

Zucker, 1994), suggesting that the transition to adulthood itself has some impact on the long-term continuation of alcohol-related problems into adulthood (cf. Tarter & Vanyukov, 1994).

Distal and Proximal Developmental Influences

Closely tied to the matter of understanding the power of developmental transitions in shaping people's lives is the issue of distal and proximal developmental influences. Developmental transitions reflect proximal developmental influences, which may mediate the more distal influences, operate independently of distal developmental influences, or even disrupt distal influences. For example, for some young people, the various psychosocial developmental transitions of adolescence set the stage for the manifestation of risky trajectories rooted in childhood (or earlier); for others, the many transitions of adolescence contribute to some (statistically normative) venturing into problem behaviors in general, and into experimentation with substance use in particular (e.g., Jessor & Jessor, 1977; Rose, 1998).

When attempting to understand college drinking, proximal influences are often more central than distal influences, underscoring the importance of our emphasis on developmental transitions. Nevertheless, it is clear that distal and proximal influences are often intertwined. Distal developmental influences may structure transition-inspired proximal influences, and in turn these proximal influences may mediate the effects of distal influences. Integrating our proximal focus with a longer-term developmental focus is necessary to more fully capture how development relates to substance use across the life span.

Conceptual Models Relating Developmental Transitions to Substance Use

Behavioral and lifestyle health risks tend to increase during adolescence. Such risks do not accrue automatically with age but rather as a function (directly or indirectly) of the numerous developmental transitions. How do developmental transitions relate to increases (and decreases) in health risks, and specifically in substance use? To begin to address this question, we consider five interrelated conceptual models based on our previous work (Schulenberg et al., 1997b, 2001) and that of others (e.g., Graber, Brooks-Gunn, & Galen, 1998). By focusing specifically on developmental transitions in these models, our purpose is to highlight proximal and contextually based developmental connections with substance use, connections that are central to the topic of college drinking. In addition, developmentally sensitive substance abuse policy and program implications follow from each model (see also Maggs, Schulenberg, & Hurrelmann, 1997). The five models are described next and summarized in Table 1.

Overload Model

In the first model, health risks are viewed as a potential but not inevitable result of experiencing developmental transitions. When developmental transitions overwhelm current coping capabilities, health and well-being are likely to suffer. Health risk behaviors (such as increased alcohol and other drug use) may be used as an alternative strategy for coping (e.g., Damphousse & Kaplan, 1998), which in turn may undermine other more effective coping strategies (e.g., Pandina, Labouvie, Johnson, & White, 1990; Wills & Hirky, 1996). Across

the life span, the stress typically generated by experiencing a developmental transition is likely to be effectively managed by one's usual coping strategies. Nevertheless, when major and multiple transitions are experienced within a short period of time, which tends to happen during adolescence and especially when entering college, existing coping strategies are likely to be challenged (Mechanic, 1983). This model is consistent with Coleman's (1989) Focal Theory in which he argues that decrements in well-being during adolescence result not from hormone-induced "storm and stress," but instead from the multiple and simultaneous transitions that occur in a relatively short period of time. A classic empirical example of this is the work of Simmons and Blyth (e.g., 1987). They found that it was not simply entering puberty or making the transition to middle school that adversely affected self-esteem, but rather the simultaneous experience of the two changes along with other transitions such as the initiation of dating.

Potential interventions based on this model include attempting to separate in time important transitions (e.g., Brooks-Gunn & Paikoff, 1997; Eccles, Lord, Roeser, Barber, & Jozefowicz, 1997), as well as increasing adolescents' coping capacities (e.g., Compas, 1995; Nurmi, 1997; Petersen, Leffert, Graham, Alwin, & Ding, 1997), perhaps by preparing them in advance and offering support mechanisms during the transition (Maggs et al., 1997; Schulenberg et al., 2001).

Developmental Mismatch Model

In the second model, increased health risks and opportunities are viewed as resulting from the impact of developmental transitions on the developmental match (e.g., Eccles et al., 1993, 1997; Galambos & Ehrenberg, 1997) or goodness-of-fit (e.g., Lerner, 1982; Lerner, Ostrom, & Freel, 1997) between individuals and their contexts. In conceptualizing the developing individual as embedded in his/her changing ecological niche, the match between the individual's developmental needs and desires and what is afforded by the context is itself dynamic. Developmental transitions can serve to improve the match and thus provide opportunities for increased health, or they could serve to lessen the match and thus adversely affect health. For example, a common (if not universal) characteristic of adolescence is the desire for increased freedom and responsibilities for control of one's life. To the extent that a developmental transition results in a new context that is appropriately responsive to this desire, it could result in salutary effects for the young person, including enhanced well-being, reduced frustration and stress, and opportunities for success in accomplishing goals. In contrast, to the extent that opportunities for freedom and responsibility are blocked or even decreased as a result of the transition, then it is likely that health and well-being will be adversely affected.

The mechanisms underlying the Developmental Mismatch Model take many forms. For example, an increased mismatch, such as an adolescent with growing needs for independence and self-expression entering a junior high or high school that effectively thwarts such needs, could cause the young person to become turned off to the school context and go elsewhere to seek fulfillment and challenge in an unhealthy compensatory context (e.g., deviant peer group) (e.g., Eccles et al., 1993). On the other hand, an increased match could serve to provide the young person with developmentally appropriate challenges and experiences, feelings of competence, and increased well-being. Increased health risks or opportunities may also occur when a developmental transition results in a decreased or

increased concordance among the developing individual's several immediate contexts, that is, mesosystem links (Bronfenbrenner, 1979). For example, entry into college places the young person in new peer and academic contexts, and to the extent that these two contexts engender overlapping or competing goals, then health risks are likely to decrease or increase, respectively.

This Mismatch Model stands in contrast to the Overload Model in that it focuses more on the interaction between the developing person and the changing context. Also, the Mismatch Model is able to account for health opportunities just as easily as it does health risks. To the extent that developmental transitions can serve to increase the synchrony between developmental needs and contextual affordances, health risks can be diminished.

Increased Heterogeneity Model

In this model, developmental transitions are viewed as moderators or exacerbators of ongoing health risk trajectories. Developmental transitions serve to increase interindividual variability in functioning and adjustment, and in this way, can be viewed as important junctures along one's health status trajectory. Evidence from a variety of studies indicates that divergence increases throughout adolescence between those who cope effectively with various stressors and those who do not (e.g., Kazdin, 1993; Petersen, 1993). For example, Eccles et al. (1993, 1997) provides evidence to suggest that the transition to junior high is worse for young people already experiencing difficulties with behavior problems and school adjustment (see also Berndt & Mekos, 1995), and likewise that those who have difficulties with the transition are likely to have increasingly severe difficulties into high school. Barkely, Anastopoulos, Guevremont, and Fletcher (1991) discuss the difficulties that adolescents with attention deficit hyperactivity disorder (ADHD) have in making transitions in the peer domain and how these difficulties in turn adversely affect self-esteem and contribute to increased risk taking. Evidence also indicates that psychopathology, including schizophrenia and major depression, tends to manifest first during adolescence and young adulthood, suggesting that one contributing factor is likely to be ongoing and escalating difficulties with negotiating developmental transitions (e.g., Kazdin, 1993; Petersen, Compas, Brooks-Gunn, Stemmler, Ey, & Grant, 1993).

This third model represents, to some extent, an elaboration of the first two models, in that it focuses on individual differences in ongoing developmental trajectories and thus attempts to interweave distal and more proximal developmental influences. This "pathways" perspective (e.g., see Cairns & Cairns, 1994; Caspi, Elder, & Bem, 1988; Crockett & Crouter, 1995) is consistent with Erikson's (1950, 1968) psychosocial theory of life course development, in which the individual's resolution of one developmental crisis (e.g., adolescent identity vs. identity confusion) is dependent on how one resolved the previous crises (e.g., pre-adolescent industry vs. inferiority) and has implications for the resolution of the subsequent crises (e.g., young adulthood intimacy vs. isolation) (see also Havighurst, 1952; Sullivan, 1947). There are likely to be several mechanisms (and the contextual and individual levels) that serve to exacerbate a trajectory of ongoing health risks. Indeed, college itself, which is generally associated with greater increases in well-being during the transition to young adulthood (Schulenberg et al., 2000) is likely to be one important mechanism for increased heterogeneity in health trajectories. Another mechanism may be a lack of social support to alter, and an abundance of support to maintain, a trajectory of

ongoing risky behaviors (e.g., Brown, Dolcini, & Leventhal, 1997; Caldwell & Antonucci, 1997). According to Nurmi (1997), an important individual mechanism involves self-defeating cognitive styles. The prevention implications of this model include, for example, the need to alter self-defeating coping strategies and enhance social networks that discourage risky behavior for youth who are following worrisome trajectories (e.g., Eggert, Thompson, Herting, & Nicholas, 1994; Palinkas, Atkins, Miller, & Ferreira, 1996). Furthermore, as with the Mismatch Model discussed above, interventions aimed at providing young people with alternative challenging experiences and opportunities for success are likely to have long-term, beneficial health effects.

Transition Catalyst Model

In the fourth model, substance use and risk taking in general are viewed as important components of negotiating certain developmental transitions. The idea that some amount of adolescent risk taking is normative is supported by the high prevalence rates and by evidence that it often accompanies healthy personality development (e.g., Baumrind, 1987; Shedler & Block, 1990; Silbereisen, Eyferth, & Rudinger, 1986). According to Chassin, Presson, and Sherman (1989), risk taking and even deviance can serve "constructive" as well as "destructive" functions in adolescents' health and development (see also Jessor & Jessor, 1977; Maggs, Almeida, & Galambos, 1995; Silbereisen & Noack, 1986; Zucker, 1989). For example, risk taking appears to be an important aspect of negotiating greater autonomy from parents (e.g., Irwin & Millstein, 1992). Likewise, as Maggs (1997) demonstrates, alcohol use and binge drinking during the transition to college may help adolescents achieve valued social goals, such as making friends in a new environment. At the same time, however, binge drinking threatens one's safety and short- and long-term health and well-being.

According to the identity literature, experimentation with alternative identities may involve some increased risk taking. Given that failing to explore options may lead to premature identity foreclosure (Erikson, 1968; Marcia, 1994; Waterman, 1982), some risk taking can be viewed as an important component of developmental transitions associated with identity formation. This potential importance of risk taking highlights an important dilemma with this model with respect to intervention implications. To the extent that risk taking plays an essential role in identity formation, as well as in negotiating peer-related and other developmental transitions (e.g., Brown et al., 1997; Chassin, Tetzloff, & Hershey, 1985), attempts to eliminate risk taking may in turn have adverse consequences for identity development in particular and optimal development in general (e.g., Baumrind, 1987). Of course, health-enhancing behaviors may also be components of negotiating developmental transitions. For example, reducing alcohol and other drug use appears to be part of the transition to marriage (Bachman et al., 1997; Leonard & Rothbard, 1999; Temple, Fillmore, Hartka & Johnstone, 1991).

Heightened Vulnerability to Chance Events Model

The final model is based on the role of chance in altering the courses of lives (Bandura, 1982a). Powerful, life-altering, unpredicted occurrences are ubiquitous: some people who sit next to each other during college orientation become lifelong friends, some people die from freak accidents, and so on. Yet chance events, large and small, are often less

random than they may first appear (Bandura, 1998). The lifelong friends who first met at college orientation likely had similar backgrounds or academic interests that led them to be at the same meeting, and were likely to be receptive to this "chance" encounter.

Just as there are interindividual differences in receptivity to chance events, there are also intraindividual changes in this receptivity, with certain periods along the life span being more amenable to chance effects. Major developmental transitions that involve new contexts, such as the transition to college, may be particularly propitious junctures in the life span because they engender heightened sensitivity to, and exploratory behavior of, the new context and the self in relation to the new context. Young people undergoing such transitions may seek out, and be open to the effects of, novel experiences offered by the new setting. As they explore their new context seeking to discover comfortable niches, chance events may take on special significance. Thus, developmental transitions can increase one's contact with novel experiences and heighten one's vulnerability to the positive and negative effects of chance events. Just as unexpected salutary effects are likely to result from these increased significant chance events and encounters, so too are some health-compromising effects, including increased substance use as well as increased negative consequences of such use.

While intervening in such chance events and encounters typically is viewed as beyond the scope of prevention, this model suggests the importance of attempting to increase awareness of and resiliency against some of the negative effects of chance events and encounters. In addition to risk awareness campaigns, which are common on college campuses, life experiences prior to college are likely to be helpful in countering negative effects of chance events. The transition to college should not be the first time that the young person experiences the full weight (and joy) of personal freedom and responsibility. Given that exploratory behavior tends to increase during the transition to college, earlier, pre-transitional exploratory experiences are likely to be beneficial. And given that early but limited exposure to risks has some long-term salutory effects by promoting resiliency against future negative events (e.g., Garmezy, 1983; Rutter, 1990), some opportunity to cope with adversity prior to the transition to college may be beneficial as well.

Summary

The five conceptual models are summarized in Table 1. These models are not mutually exclusive. While some of the models can be viewed as competing models (especially the first three), the models are more appropriately viewed as representing the diverse array of connections between developmental transitions and health risks, especially alcohol and other drug use. Given the multiplicity of developmental transitions as well as of health risks and opportunities, all five models are likely to operate across individuals in a given population and perhaps even within individuals over time.

It is important to recognize that, together, the five models represent only part of the total relational structure between substance use and developmental influences, correlates, and outcomes. These models, by focusing on developmental transitions, highlight the more developmentally proximal and contextually based connections with substance use, a set of connections that are central to understanding college drinking. Simply, when searching for the developmental roots of college drinking, it is often unnecessary or unproductive to go very far "upstream." This is not to deny distal and longer-term developmental influences on

college drinking, and indeed, our Increased Heterogeneity Model interweaves developmental transition influences with ongoing health risk trajectories. Clearly, there are powerful early influences that exert ongoing direct and indirect effects on individuals' adjustment in general and alcohol use and abuse in particular (e.g., Sher, Trull, Bartholow, & Vieth, 1999; Windle & Davies, 1999; Zucker, 2000). As we discussed earlier in this paper, integrating our proximal focus with the predominant longer-term developmental focus can yield broader models that more fully capture the complexities of the developmental–substance use relationships.

In the following sections, we discuss in detail the various developmental transitions that occur during adolescence and the transition to young adulthood (including in the domains of biology, cognition, identity, affiliations, and achievement), with a focus on understanding how the common developmental processes of the second decade of life may shape the experience, needs, and behavior of the developing individual. We consider examples from the empirical literature to illustrate how the various transitions relate to increases and decreases in alcohol and other drug use. As mentioned previously, given the wealth of relevant topics and literature, our strategy is to be illustrative rather than comprehensive, allowing us to highlight the usefulness of taking a developmental perspective on substance use etiology and intervention. The major areas of transition are summarized in Table 2.

Fundamental Biological and Cognitive Changes

Only during infancy are the rates of physical and cognitive growth more rapid than during adolescence. Of course, unlike infants, adolescents are keenly aware of their physical and cognitive changes (Silbereisen & Kracke, 1997). This section reviews major developmental changes associated with physical and cognitive development during adolescence and discusses how they may contribute to adolescents' and young adults' propensity to use alcohol.

Pubertal/Physical Development

Physical changes. In early adolescence, pubertal development is characterized by a rapid acceleration in growth (including dramatic gains in height/weight and changes in the body composition of fat and muscle) as well as the development of primary and secondary sex characteristics (Marshall, 1978). Progressive hormonal changes that begin much earlier in childhood are the causes of these outwardly visible physical manifestations. Although there are large inter-individual differences in the timing of the onset of puberty, by the time adolescents finish high school, the great majority have attained their full adult height and are fully capable of reproduction. Hormonal changes and societal expectations combine to increase adolescents' interest in romantic and sexual relationships (Udry, 1987) as well as increasing their interest in and tolerance of alcohol (Spear, 1998). Furthermore, across the life span, the early twenties are the time when peak physical functioning occurs (e.g., as measured by heart and lung strength, athletic performance) (Arnett, 2000), making it more possible to quickly overcome the negative physical effects associated with excessive alcohol.

Looking (and desiring to be) older. As a result of height and weight gains as well as the growth of secondary sex characteristics (e.g., breasts, facial hair), adolescents take on an increasingly adult appearance. As they move through high school, many individuals begin to resemble cultural ideals of adult attractiveness and may be mistaken for young adults, making the (illegal) purchase of alcohol easier. Adolescents (particularly girls) who mature at younger ages are more likely to associate with older and more deviant peers (Magnusson, Stattin, & Allen, 1986). In addition to increasing access to substances such as alcohol (Wagenaar, Toomey, Murray, Short, Wolfson, & Jones-Webb, 1996), these multiple simultaneous transitions may overload the young person's coping capacity (i.e., the Overload Model), setting the stage for increased alcohol and other drug use.

Some adolescents want to be seen as older, particularly those who are most aware of the privileges of adult status, including autonomy and freedom (Galambos, Kolaric, Sears, & Maggs, 1999). The legal ability to buy alcohol is directly linked to age (21 years in the U.S., among the oldest age of majority in the world), making the right to purchase and consume alcohol a privilege of adulthood. Consistent with the Transition Catalyst Model, alcohol use can also be seen as an attempt to appear more mature, as if one has gained adult status (Jessor, 1992; Newcomb, 1987). The discrepancy between chronological age norms and desired age-related behaviors can also be understood as an example of Developmental Mismatch.

Cognitive and Moral Development

Normative changes. During early adolescence, important normative transformations in cognitive reasoning abilities occur, including increases in the ability to think abstractly, consider theoretical possibilities, and view issues as relative rather than absolute (Keating, 1990). In particular, alternative perceptions of reality (e.g., those of parents, teachers, or police officers) become viewed by the adolescent as simply one of many possible perspectives. As a result of such cognitively based changes, adolescents become capable of abstract reasoning similar to adults; often they may seem to become more argumentative and confrontational as they begin to question authority and think for themselves (Smetana, 1988). In addition, adolescents begin to see themselves from the perspective of their valued peers, understanding the implications of their behaviors on the image that their peers have of them.

In the related domain of moral development, a dominant approach has been Kohlberg's (1969) stage theory of moral reasoning. The moral reasoning of younger adolescents tends to be conventional, giving primary importance to gaining the approval of others and maintaining societal order. Individuals who reason conventionally (compared to those who reason pre-conventionally) place more emphasis on principles and less on rewards and punishments as a basis for reasoning about what is appropriate moral behavior. It is not until late adolescence, if at all, that individuals reach the post-conventional stages of moral reasoning, in which society's rules and standards are seen to be based on higher-level universal principles, such as equality, fairness, or justice. Gilligan's (1977) critique of Kohlberg's stage theory of moral reasoning argued that a standard of "commitment in relativism," a basis for moral decisions more commonly used by women than men, was under-emphasized in the original theory with its sole focus on absolute principles of justice. Putting aside the debate about gender differences in moral reasoning styles, it is worth noting

that human decisions and justifications for behaviors involve emotional, interpersonal, and social elements as well as abstract cognitive ones.

Applied to judgments about whether it is acceptable for adolescents to use substances such as alcohol and tobacco, conventional reasoning could lead to conflicting thoughts about whether it is right to experiment. Clearly, society legally forbids substance use by adolescents, and adolescents typically do want to maintain positive relationships with their parents and other important adults. However, competing desires to gain their peers' approval may also be very powerful. If older adolescents begin to reason at a post-conventional level, societal prohibitions against youthful alcohol use may seem much less compelling. Individuals may accept the principle that it is wrong to harm others, and therefore aim not to drink and drive, but age-21 drinking laws may be viewed as arbitrary and discretionary, and thus not respected.

Invincible and invulnerable? It is commonly asserted that adolescents engage in an inordinate level of risk taking because they think they are invincible or invulnerable, believing the "personal fable" that they are uniquely special such that no harm will come to them regardless of their own behavior (Elkind, 1967). However, research contrasting the decision making of adolescents and adults has generally not supported the existence of clear age differences in thoughts of invincibility or the personal fable (e.g., Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993; Millstein, 1993; Quadrel, Fischhoff, & Davis, 1993). Although many individuals do cognitively minimize potential negative consequences of their actions by ignoring the risks of some behaviors, older adolescents appear to be no more likely to do this than adults (Furby & Beyth-Marom, 1992). Clearly, with their increased ability for abstract thinking, adolescents can understand probabilities more clearly than children can, and are able to imagine possible negative consequences of their actions. Still, it seems likely that at least for some young people, feelings of invincibility do contribute to increased risk taking. Furthermore, it is important to remember that there are both positive and negative consequences associated with engaging in risk behaviors such as drinking alcohol, as well as positive and negative consequences associated with *not* engaging in them (Beyth-Marom & Fischhoff, 1997). How adolescents (and adults) value and weigh the relative costs and benefits of such outcomes is an area of active debate and research.

For many older adolescents and young adults, the decision to drink is a given, and rational decision making becomes important in regard to *when*, *where*, *with whom*, and *how much* to drink. Theoretically, decision-making models are useful for understanding these choices. And practically, these choices may make the difference between light/moderate drinking and harmful binge drinking. Of course, rational decision-making models will get us only so far in understanding drinking behavior. Particulary as group-level activities, heavy drinking and associated behaviors may not always represent pre-planned or rationally considered choices. Decisions about how much *more* to drink or about whether to engage in other risky behaviors are often made when individuals do not have the benefit of being sober.

Age-related changes in alcohol outcome expectancies. Alcohol expectancies refer to the expectations individuals have for the positive and negative outcomes associated with drinking alcohol. Cross-sectional and longitudinal research has demonstrated that with age, children and adolescents become increasingly aware of potential benefits of drinking alcohol, despite its costs or risks (Dunn & Goldman, 1996; Goldman, Del Boca, & Darkes, 1999;

Maggs & Schulenberg, 1998; Miller, Smith & Goldman, 1990). Children tend to associate primarily negative global consequences with drinking alcohol (Johnson & Johnson, 1996). However, beginning in early adolescence, there is a normative age-related decline in endorsement of negative expectancies regarding the effects of alcohol, accompanied by a normative age-related increase in endorsement of positive expectancies. Perhaps the simultaneous awareness of both positive and negative effects of alcohol is facilitated by adolescents' increased ability for abstraction and for hypothetical thinking. Furthermore, hypothetical thinking may cause adolescents to have a better sense of how drinking fits into their desired self-definitions and reputations. In any case, these normative developmental changes in alcohol expectancies represent a significant challenge for prevention programmers, because endorsement of the benefits of drinking (and the lack of being worried about its costs) are powerful risk factors for alcohol use among adolescents and adults alike (Goldman, 1994; Goldman, Brown, & Christiansen, 1987; Leigh & Stacy, 1993; Smith, Goldman, Greenbaum, & Christiansen, 1995).

Identification of adult hypocrisy. While younger children may be willing to accept blanket adult statements that alcohol is bad and not to be consumed by anyone under the age of 21, adolescents and young adults are much more likely to notice the hypocrisy of such messages about alcohol use when they conflict with common cultural behaviors. For example, parents, teachers and the police prohibit teens from drinking due to its harmful effects, but a large proportion of American adults drink, and many of them do so in a healthy or responsible manner. One implication of normative cognitive changes toward increased abstraction, awareness of the benefits of drinking, and tendency to identify adult hypocrisy is that adolescents will be less likely to comply with blanket prohibitions against alcohol use as they get older. As a result, one implication for prevention is that programs or messages targeted at older teens and young adults (including college students) need to consider the possibility that they will sound hypocritical and be realistic about the ineffectiveness or even counter-productivity of prohibition approaches. In many contexts, harm reduction approaches should be seriously considered (see e.g., Marlatt, 1998; Marlatt, Baer, & Larimer, 1995).

Identity Domain Transitions

Identity domain transitions are closely tied with the fundamental biological and cognitive changes of adolescence as well as with affiliation and achievement domain transitions. Adolescents and young adults experience fundamental changes in their self-definition and identity (Erikson, 1968; Marcia, 1994; Phinney & Kohatsu, 1997) and self-regulation (Harter, 1999). Ideally, personal identity formation occurs as individuals, through exploration and commitment, develop a secure and enduring sense of self that encompasses an integrated set of personal interests, values, goals, and commitments (Nurmi, 1997; Waterman, 1982). Through a process of questioning previously taken-for-granted beliefs and assumptions, older adolescents actively explore alternative philosophies, behaviors, and lifestyles. Although identity exploration is associated with instability in well-being, as well as with experimentation and risk taking that has the potential to compromise one's health, subsequent identity achievement is assoicated with higher levels of well-being and a lower incidence of health-compromising behaviors (Jones, 1992; Marcia, 1994). Attempting to delay or avoid identity transitions (i.e., neither actively exploring one's identity nor making

commitments) is also associated with psychosocial difficulties and problem behaviors (Jones, 1992; Marcia, 1994).

Identity exploration and commitments occur in connection with one's immediate context and larger communities. Some active areas of identity development research include how family interaction patterns facilitate or hinder identity exploration (e.g., Grotevant, 1987), how ethnic identity is explored particularly among ethnic minorities in the U.S. (e.g., Phinney & Kohatsu, 1997), and how community service may assist identity development (Youniss & Yates, 1997). College contexts and experiences provide many young people the opportunity to continue and/or reexamine their identity quests.

Although identity exploration is normative and considered part of healthy development, it may also represent a risk factor for experimentation with potentially risky behaviors such as alcohol or other drug use (Maggs et al., 1997). Most health promotion programs attempt to reduce risk behavior with the goal of protecting individuals from potential negative consequences. The role played by drinking alcohol in adolescents' lives is paradoxical, just as it is for other risk behaviors, such as illicit drug use and sexual behavior (Maggs et al., 1995; Maggs & Hurrelmann, 1998). Consistent with the Transition Catalyst Model, despite the possibility of serious harm from alcohol misuse, drinking also may serve important constructive functions for adolescents, such as helping them to make friends or explore personal identities, and indicating a transition to a more mature status (Chassin et al., 1989; Jessor, 1987; Kaplan, 1985; Silbereisen et al., 1986). In fact, some scientists have argued that experimenting with risk behaviors such as drinking alcohol is one of the few remaining broadly sanctioned rites of passage of adolescence in Western societies (e.g., Jessor, 1987; Schulenberg, O'Malley et al., 1996; Shedler & Block, 1990). As a result, some psychological theorists have questioned the wisdom of attempting to limit adolescents' experimentation, because if adolescents are prevented from trying out different behaviors and lifestyles, their identity exploration may be curtailed or cut short, leaving adolescents without a self-determined commitment to a clear identity and set of personal values (e.g., Baumrind, 1987).

Affiliation Domain Transitions

Family of Origin

Relationships with parents. The adolescent years are a period of significant reorganization and change in family relationships (Grotevant, 1987). Normative transformations in family relationships during the second decade of life include increased autonomy and independence from parents, but ideally these developments occur in a context of continued support and attachment between developing adolescents and their parents (Grotevant, 1997; Silverberg & Gondoli, 1996). The *quantity* of interaction often decreases: older adolescents spend less time in family activities than do younger adolescents (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996), and more time is spent in contexts outside the family such as at school, with peers, and at work. The amount of time spent with family members may also decrease dramatically if an individual moves away from home to go to college (Hays & Oxley, 1986; Shaver, Furman, & Buhrmester, 1985).

Despite decreases in the frequency of interaction, the *quality* of parent–adolescent relationships is typically not reduced during the transition to adulthood. In fact, many studies have documented improvements in parent–adolescent relationships following the physical departure of the child from the family home (e.g., Aseltine & Gore, 1993; Pipp, Jennings, Shaver, Lamborn, & Fischer, 1985; Sullivan & Sullivan, 1980). In terms of alcohol use, direct parental monitoring tends to lessen in importance as adolescents mature and gain more behavioral autonomy. However, to the extent that adolescents and young adults have internalized their parents' norms, and have the continued support of their parents and families, they might be expected to make wiser choices in the long-term. Even after beginning college, students continue to seek parental contact, support, and assistance in times of stress (Kenny, 1987). Parents' efforts have important positive effects: perceived parental support and encouragement predict college plans (Sewell & Shah, 1968), higher college GPA (independent of academic aptitude; Cutrona, Cole, Colangelo, Assouline, & Russell, 1994), commitment to career development (Blustein, Walbridge, Friedlander, & Palladino, 1991), and persistence (Bank, Slavings, & Biddle, 1990). Clearly, students' relationships with their parents continue to play a major protective role promoting their healthy development and success.

Sibling influences. Although sibling influences on adolescent and young adult development have received less empirical attention than parental influences, there is some evidence that older siblings' substance use predicts early adolescents' alcohol expectancies (D'Amico & Fromme, 1997) and subsequent substance use, above and beyond parental predictors (e.g., Duncan, Duncan, & Hops, 1996). Behavior genetic studies contrasting biological and adoptive siblings also suggest that, unlike many other sibling similarities and parental "influences" that can be explained by passive genotype-environment interactions, sibling similarities in the area of adolescent alcohol use involve important environmental effects (e.g., McGue & Sharma, 1995; McGue, Sharma, & Benson, 1996). Mechanisms by which siblings impact their younger brothers' and sisters' substance use may include modeling, direct social influence, providing access to the substance or to false identification, as well as legitimizing or failing to inhibit association with friends who model or provide pressure to use alcohol (Conger & Rueter, 1996).

Transformations in Relationships with Peers

Normative age-related heightened importance of peer relations and sensitivity to peer culture during adolescence increase individuals' exposure to cultural norms and influences that may (or may not) be compatible with the norms and values of the family of origin (Berndt, 1992; Brown et al., 1997). If older adolescents move away from home to attend college, they may become part of a strongly age-graded world in which they are surrounded by thousands of same-aged peers from a variety of backgrounds and have much less contact with their parents and other adults. Many cultural myths and norms serve to support the idea of a legendary period of partying and binge drinking during the first year or years of college. However, it would be wrong to conclude that peer influences are monolithic in their power or even direction of influence (e.g., Berndt, Hawkins, & Jiao, 1999; Brown et al., 1997). Individuals tend to seek out and be selected by peers who have similar goals, values, and behaviors (Kandel, Davies, & Baydar, 1990).

At least three kinds of direct and indirect peer influences may serve as risk factors for increased alcohol use during adolescence and young adulthood. First, susceptibility to peer influences increases through at least middle adolescence, making individuals more willing to go along with their peers' suggestions that they engage in many behaviors, including risky ones (e.g., Dielman, 1994; Schulenberg et al., 1999; Steinberg & Silverberg, 1986). The uncertainty of adapting to a new college environment may temporarily exacerbate such tendencies (Caspi & Moffitt, 1993). Second, similarities between adolescents and their friends encourage continuity of behavior over time (Fisher & Bauman, 1988; Kandel, 1985). For example, students who were strongly opposed to alcohol use during high school are likely to form new friendships at college with peers who hold similar views. At the same time, prior heavy high school drinkers will also selectively find similar peers on campus, and the new freedom and mutual reinforcement may lead to accelerating use and misuse of alcohol. Third, perhaps due to cultural myths about young adults, students tend to significantly overestimate the prevalence of drinking on campus. Such inflated "norms" provide a not-so-subtle form of pro-drinking influence, as individuals may want to fit in with what they believe the group behavior to be (Baer & Carney, 1993; Perkins & Wechsler, 1996; Prentice & Miller, 1993).

In a fundamental way, alcohol use is inextricably linked to social relationships with peers. During late adolescence and early adulthood, many social activities occur in the context of drinking, such as at parties or in pubs or bars, and indeed some interactions may be facilitated by the use of alcohol. Sociability that is expressed while drinking can be seen as indicators of successful peer relationships and markers of social group bonding (Silbereisen & Noack, 1986). In fact, young adults who report higher levels of alcohol use also feel more accepted by their peers and less lonely (Maggs, 1997; Newcomb & Bentler, 1988).

Romantic and Sexual Relationships

The adolescent years bring dramatic and profound changes in sexual feelings and identity, as well as interest in and experimentation with romantic relationships and sexual behaviors. Pubertal changes provide an essential biological foundation for these transformations, but there are equally important cognitive, emotional, interpersonal, and social causes and antecedents as well. Brooks-Gunn and Paikoff (1993) identified four developmental challenges for adolescents in the domain of sexuality: becoming comfortable with their maturing bodies, accepting feelings of sexual arousal as normal and healthy, understanding that shared sexual behaviors should be mutually voluntary for both partners, and understanding and practicing safe sex. Because these challenges are at once profoundly personal yet fundamentally relational, involving complex feelings, shared behaviors, and sometimes confusing interactions with others, we argue that these four challenges are unlikely to be fully resolved prior to the college years, and are likely to remain important developmental tasks well into young adulthood.

At age 18, approximately 70 percent of adolescents have engaged in sexual intercourse (Alan Guttmacher Institute, 1994). Although this figure represents a significant historical increase since a generation ago, it is important to remember that the majority of adolescents who have had sexual intercourse have had only one partner in their lifetime, and that they have sex relatively infrequently. Moreover, at least a quarter of 18-year-olds has

never had sexual intercourse. Therefore while it is common to portray late adolescents as very sexually active, experienced, and even promiscuous, it is also true that many individuals have little sexual experience, confidence, skills, or sophistication in this arena when they arrive as new students on America's college campuses.

Coupled with a developmentally normative intense interest in finding an exciting, interesting, and attractive partner with whom one can share intimacy, romance, and/or sex, the relatively limited level of sexual experience of many college students makes them more likely to find themselves in sexual situations that may be unplanned, unreciprocated, or non-consensual. Early in a relationship, individuals are less likely to engage in safe sex or to use contraception, in part because they may lack organization, experience great discomfort discussing the issue, and fear implying that the potential partner might be risky or unhealthy.

It is not difficult to imagine how alcohol use can be paired with early sexual experiences. The desire to meet and get to know potential partners may lead individuals to seek out social situations and contexts where alcohol is served (e.g., parties, bars, clubs), and positive expectancies about the social and sexual enhancement properties of alcohol can increase motivations to drink (Cooper & Orcutt, 1997; Goldman et al., 1987). The beginning of a relationship may also be a time when more alcohol is used, which may increase risky behaviors such as neglecting to use a condom. In addition to sexual and romantic interests making alcohol use more likely, alcohol consumption in turn can make certain sexual behaviors more likely by reducing inhibitions, giving courage, and providing an "excuse" for getting wild (Dermen & Cooper, 1994; Dermen, Cooper, & Agocha, 1998).

Just as the transitions into new intimate relationships can contribute to increased alcohol and other drug use, the transition into more committed relationships, such as marriage or even engagement, can contribute to decreased substance use (Bachman et al., 1997; Leonard & Rothbard, 1999; Temple et al., 1991). This general "marriage effect" appears to explain normative age-related changes in substance use, which, after peaking in young adulthood, tends to decline rapidly as one assumes adult couple roles (Bachman et al., 1997).

Achievement Domain Transitions

Adolescents and young adults typically face major educational and/or occupational transitions every few years. These transitions represent powerful opportunities and risks for young people. Successful adaptation to and performance in educational and occupational domains *is* healthy development. The acquisition of knowledge, critical thought, and practical skills are activities that help define concurrent and future optimal development (Clausen, 1991). In contrast, difficulties in negotiating these critical transitions can contribute to cumulative and emergent health risks.

School Transitions

During their many years in formal education, children and adolescents experience a series of school- and achievement-related transitions. Early in life, they begin kindergarten (often preceded by daycare or nursery school); then many change to a middle school or junior high during early adolescence, and then move on to a high school (Eccles et al., 1997).

Each year, it is common to make transitions to new teachers and classrooms, and due to increased geographic mobility, many children and adolescents also change schools or cities multiple times due to family moves. Embedded in these formal contextual changes are more gradual and subtle alterations, including spending the entire day with the same teacher and set of students, to moving from room to room to be taught by more specialized instructors who know each student less well (Eccles et al., 1993; Entwisle, 1990). The typical college or university situation takes this shift one step further, where students take classes in multiple buildings with large groups of students, taught by highly specialized instructors who may not know each other, let alone the individual students. Of course there is incredible variation in the nature, experience, and impact of such changes. Within and between U.S. school districts is significant variability in the school conditions, facilities, policies, and performance. And at the individual level, even two adolescents who have attended the same schools for the past 12 years would not be expected to react in the same way to subsequent changes. However, given those caveats, knowing how an individual experienced and adapted to prior changes may provide useful information about how he or she may adjust to the transition to college.

The majority of American adolescents attend some form of postsecondary education after completing high school. College attendance greatly improves lifetime occupational prospects and earnings, and, when attended full-time, also tends to postpone the adoption of adult roles, since individuals typically leave school before commencing full-time work or starting a family (Marini, 1987; Sherrod et al., 1993). That is, those who go to college tend to start their first full-time job, marry, and have children later than those whose formal schooling ends with high school. An extended passage toward adulthood can have many non-educational benefits (W. T. Grant, 1988), including an opportunity to postpone the assumption of full adult responsibilities, while continuing to learn, explore ideas, and pursue personal and academic interests (Pascarella & Terenzini, 1991). Likewise, individuals can experiment with various behaviors, values, and lifestyles. In other words, the college experience can provide a safe haven for exploration, or a developmental moratorium (Sherrod et al., 1993).

Transitions to new educational settings require major adaptations: these necessary changes may be quite stressful, but they also provide opportunities for a fresh start (Aseltine & Gore, 1993; Eccles et al., 1993, 1997; Gotham, Sher, & Wood, 1997; Sher, Wood, & Gotham, 1996; Simmons & Blyth, 1987). Clearly, beginning university demands substantial adaptation and reorganization in many domains of life (Hays & Oxley, 1986; Hogan & Astone, 1986; Simmons & Blyth, 1987). Thus, it may be a time of growth, but also of vulnerability (Compas, Wagner, Slavin, & Vannatta, 1986; Sherrod et al., 1993; Takahashi & Majima, 1994; Zirkel, 1992). As discussed earlier, students' relationships with their families of origin, peers, and romantic partners undergo significant changes. In the domain of education, most American students have some prior experience with school transitions, in that they have already adapted to middle and high schools, and have succeeded in completing these educational programs. However, the transition to college, which coincides roughly for the majority of students with attaining the legal age of majority with respect to voting and making legal decisions (18 years of age), brings dramatic increases in autonomy. For example, for the first time in their lives, students have the legal right to privacy of their academic records: As a result of the 1977 federal Family Educational Rights Privacy Act (also known as the Buckley Amendment), colleges and universities can release only very limited information about students' educational records even to their parents, although recent

amendments permit the release of information about alcohol and drug violations for students who are under age 21.

Cultural norms promote a period of binge drinking as a rite of passage during the undergraduate years (Prentice & Miller, 1993). Films show large groups of students living together, partying heavily, and having a great time. Particular campuses have reputations as "party" schools with information passed formally (e.g., via the Princeton Review) or informally among social networks. Moreover, the desire to make new friends and to fully participate in the mythical experience of college life may lead to socially motivated alcohol use and binge drinking (Transition Catalyst Model) (Cooper, Frone, Russell, & Mudar, 1995; Cooper, Shapiro, & Powers, 1998; Maggs, 1997; Silbereisen & Noack, 1986). Finally, the stressful aspects of adapting to a new social environment and heavier academic demands may also promote alcohol use to help students relax and buffer stress (Overload Model) (Cooper et al., 1995; Windle, 1992).

Work Transitions

Another major component of the achievement transitions domain involves part-time and full-time work. During high school, spending more hours at work (i.e., higher work intensity) is associated with higher levels of alcohol and other drugs (e.g., Bachman & Schulenberg, 1993; Greenberger & Steinberg, 1986; Finch, Mortimer, & Ryu, 1997). There is considerable disagreement in the literature about the causal direction between work intensity and substance use, with one partial explanation involving "third variables" (e.g., disengagement from school, premature adulthood) that contribute to both increased work intensity and increased substance use during adolescence (Bachman & Schulenberg, 1993). Nevertheless, it does appear that increased work intensity is causally related to increased alcohol use during adolescence (Mortimer, Finch, Ryu, Shanahan, & Call, 1996), suggesting that the transition into a more adult-like work schedule during adolescence does contribute to increased alcohol use. Potential explanations for this relation would follow from both the Overload Model (e.g., increased stress of trying to balance long hours of work with the rest of one's life), and the Developmental Mismatch Model (e.g., many of the jobs available for adolescents may not provide developmentally appropriate experiences).

While part-time work is relatively common among college students, there has been little empirical work on the relation between work intensity and substance use during college. It is likely, given all of the other college-related influences on substance use, that any impact of part-time work is muted. Nonetheless, to the extent that part-time work contributed to additional stress (i.e., the Overload Model), alcohol and other drug use would be expected to increase; in contrast, to the extent that part-time work provided a good match with course work and designed career path (i.e., the Developmental Mismatch Model), alcohol and other drug use might decrease as a function of work.

The school-to-work transition is associated in general with declines in substance use (Bachman et al., 1997), although this tends to be less true for young people who go from high school directly to the full-time work force (Schulenberg et al., 2000). The school-to-work transition is in many ways a defining feature of the transition to young adulthood (Hamilton, 1994), and the assumption of full adulthood status (and all of the associated changes in responsibilities, freedoms, contexts, and schedules) is likely to serve to decrease heavy

drinking and other drug use. As discussed earlier, however, the declines appear to be governed more by the transition into marriage than the transition into full-time work (Bachman et al., 1997).

Transition to College and the Five Conceptual Models

Although Sections C through F discussed the fundamental changes and transitions separately by domain, it is clear that they are all interrelated in their occurrences and impacts on substance use and other health risks. The many aspects of the transition to college can be interpreted and analyzed in alternative ways using the five models elucidated earlier in this paper. For example, two competing theories about the challenges of adapting to major developmental transitions are cumulative stress theory (Overload Model) and person-environment fit theory (Developmental Mismatch Model). Cumulative stress theory draws attention to the multiple role changes demanded by major life transitions (Coleman, 1989; Simmons & Blyth, 1987). In the case of the transition to college, individuals begin as adolescents but end as young adults; they move from being a high school student to a university student, sibling to roommate, child in a family to adult in an apartment or residence hall, etc. The simultaneous pile-up of multiple role and context changes is likely to be difficult and somewhat stressful, particularly for individuals who are weak in social, academic, and coping skills.

In contrast, person-environment fit theory focuses on the match or mismatch between the needs of the developing individual and the opportunities provided by the context (Eccles et al., 1993, 1997; Lerner et al., 1997). Finishing high school and moving away from home involve the disruption of and the potential for changes in habits and lifestyles. In many ways, the transition to college (and the transition to young adulthood more generally) represents a new beginning for young people. There is the opportunity to make new friends, enjoy new-found freedom, direct one's own daily life, explore educational and future career alternatives, and experiment with different behaviors and lifestyles. For some, the transition may reduce exposure to difficult situations, such as conflicted family relations or high school unpopularity, providing the opportunity to make a break with a troubled past (Aseltine & Gore, 1993). The mismatch of secondary schools with adolescents' needs means that many students do better after adjusting to college (Bachman, O'Malley, & Johnston, 1978).

Alternatively, the Increased Heterogeneity Model draws attention to the tendency for challenging transitions to magnify existing strengths or weaknesses. For more vulnerable individuals, moving away from home to live in an unfamiliar university environment can be intensely stressful (Compas at al., 1986; Shaver et al., 1985; Zirkel, 1992). Students who lack social, academic, and organizational skills may find the demands of college life overwhelming, whereas students who are socially confident and who are ready for increased academic challenges are primed to take advantage of all that the college experience has to offer.

The Transition Catalyst Model and Heightened Vulnerability to Chance Events Model are also very relevant to the transition to college. Cultural norms that promote a period of binge drinking contribute to statistically normative experimentation during the college years, and the many changes associated with adapting to a new college environment

provide ample opportunities for students to meet new people and try new activities as they explore the institution and its social and academic offerings.

IMPLICATIONS FOR RESEARCH ON SUBSTANCE USE ETIOLOGY AND PREVENTION

Multi-wave, contextually sensitive longitudinal research is necessary for improving our understanding of how substance use fits into young people's lives. Particularly during adolescence and young adulthood, when pervasive individual and contextual change is the backdrop, knowing a person's substance use at only one or two points in time tells us very little about its likely course, causes, and consequences (e.g., Duncan, Alpert, Duncan, & Hops, 1997; Newcomb, Scheier, & Bentler, 1993; Zucker, 2000). Indeed, following the same individuals over several occasions, whether as part of an etiologic study or intervention evaluation (or both), represents our best strategy for effectively addressing the most important questions we face about substance use etiology and intervention (Eddy, Dishion, & Stoolmiller, 1998; Loeber & Farrington, 1994).

While it is far better to have two waves of data rather than one, panel data that span three or more waves are especially informative (Curran & Muthen, 1999). Multiple waves of data permit the consideration of more complex mediation and reciprocal models aimed at understanding how relationships of risk and protective factors with substance use unfold (Rutter, 1994; Windle & Davies, 1999). In addition, multiple waves of panel data make it possible to identify different (often non-linear) trajectories of substance use in terms of the timing of onset and pattern of change over time, which are essential for determining the type and severity of substance abuse problems (Babor et al., 1992; Cloninger, 1987; Zucker, 1987).

Short-term multi-wave panel data are useful for examining processes among temporally proximal risk factors and substance use, especially during major developmental transitions such as the transition to college (e.g., Maggs, 1997). Longer intervals between waves make it difficult to capture the sometimes rapid changes and reciprocal influences that occur during these transitions (e.g., forming new friendships, increasing binge drinking). But long-term multi-wave panel data are essential for understanding how distal influences relate to proximal ones. For example, while early delinquent activity during adolescence is one of the strongest predictors of both the early onset of substance use and later problem substance use (Dishion, Capaldi, & Yoerger, 1999; Donovan & Jessor, 1985; Kandel, 1978), long-term longitudinal studies also indicate the importance of developmentally distal influences. In a long-term longitudinal follow-up of alcohol-related symptomatology and alcohol dependence in late adolescence and early adulthood, Moffitt, Caspi, Dickson, Silva, and Stanton (1996) traced the source of the link between adolescent delinquency and substance use to behavioral undercontrol observed at three years of age, suggesting that adolescent delinquent activity serves less as a stand-alone causative agent, and more as a mediator (or ongoing extension) of earlier behavior difficulties (see also Brook & Newcomb, 1995). Without long-term panel data, this distal causal connection would have been overlooked, a meaningful oversight given the alternative intervention implications. More longitudinal research that attempts to link such developmentally distal influences with proximal transitional-related influences is essential. In particular, an important gap in the literature is an understanding of the extent to which proximal influences reflect continuity (e.g., escalating binge drinking that is

predictable based on earlier childhood and adolescent risk factors) versus actual discontinuity (e.g., escalating binge drinking during college that is not predictable based on earlier childhood and adolescent risk factors).

A developmental perspective also emphasizes the importance of taking a long view on intervention effects (Curran & Muthen, 1999; Maggs et al., 1997; Schulenberg et al., 2001). Positive short-term effects of preventive or clinical efforts are certainly of consequence, particularly as they relate to avoiding immediate health risks. However, when such efforts produce enduring changes, the long-term impact is of a much greater magnitude. It is also often the case that no measurable changes in behavior are visible immediately after the conclusion of a preventive intervention, for example, a middle school program to prevent escalations in substance use during adolescence (Dielman, 1994). However, minor alterations in the slope of a developmental trajectory can result in consequential changes as they accumulate over a period of years (e.g., Kellam & Rebok, 1992; Maggs & Schulenberg, 2001). This important long-term impact would be missed if data were collected only at the conclusion of the program.

Finally, intervention research has much to offer developmental theory and research by providing opportunities to address fundamental questions about causal relationships concerning alcohol and other drug use during adolescence and young adulthood (Maggs & Schulenberg, 1998, in preparation). Etiological theories can be put to rigorous test by attempts to alter the constellation of risk factors and observing whether hypothesized changes in targeted behaviors occur (Bronfenbrenner, 1979; Coie et al., 1993; Dielman, 1994; Dishion, McCord, & Poulin, 1999; Flay & Petraitis, 1994; Kellam & Rebok, 1992; MacKinnon, 1994).

PROGRAM AND POLICY IMPLICATIONS REGARDING COLLEGE DRINKING

The primary causes of mortality and morbidity during the second decade of life are related to preventable social, environmental, and behavioral factors (Crockett, 1997; Irwin & Millstein, 1992; Millstein, Petersen, & Nightingale, 1993; U.S. Congress, 1991). Many physical and mental health problems of adulthood have their origin in habits that are formed during adolescence (e.g., smoking, exercise, eating habits) (Friedman, 1993; Jessor, 1984), as well as in maladaptive coping styles that are consolidated during this time (Compas, 1995; Kazdin, 1993; Nurmi, 1997; Petersen et al., 1997). In addition, in the period spanning adolescence and young adulthood, many consequential life decisions are made concerning educational attainment, occupational choices, relationship and family formation, and lifestyle options, making this a formative period in regard to health and well-being across the life span. Thus, these years can be viewed as a sensitive period for interventions that can have life-long impact (e.g., Hamburg, Millstein, Mortimer, Nightingale, & Petersen, 1993; Maggs et al., 1997; Susman, Dorn, Feagans, & Ray, 1992).

In this section, we discuss selected program and policy implications regarding college drinking. These implications follow from the developmental perspective offered in this paper, and consist of both broader developmental intervention implications as well as alcohol-specific programming implications. The implications we offer are not meant to constitute an original or comprehensive list, and given that they are not necessarily based on program evaluations or other empirical research, appropriate caution is needed when

considering their usefulness or feasibility. We offer this selective list to help illustrate how developmental considerations can and should come into play when initiating and examining programs and policies aimed at reducing college drinking. These implications are summarized in Table 3 and presented in more detail below.

Broader Developmental Intervention Implications

Developmental Transitions Represent Windows of Opportunity for Effecting Change

From a developmental perspective, a primary goal of intervention is to change attitudes and behaviors that are already changing—that is, to ameliorate and redirect potentially risky trajectories (e.g., Kellam, Koretz, & Moscicki, 1999; Maggs et al., 1997; Schulenberg et al., 2001). As noted earlier in this paper, developmental transitions can involve pervasive changes in the individual, the context, and their interaction. Thus, these periods in the life course represent potential times of vulnerability. They also represent opportunities for individuals to develop new healthy habits, skills, and relationships. For example, the move from high school to college may allow an adolescent who was a frequent binge drinker to make new friends who have more healthful and balanced social interactions. In this way, developmental transitions are sensitive periods for intervention: programmers can take advantage of these naturally occurring windows of disequilibrium, before unhealthy new patterns and lifestyles are established.

Colleges can take this opportunity to try to influence the formation of new relationships for the better. For example, many students meet new college friends during orientation days. If few activities are available at night during orientation and a campus is surrounded by bars, individuals predisposed to substance use will find each other and potentially form enduring peer groups whose recreation may center around alcohol use. Residential colleges can also use the annual influx of new students to creatively attempt to break up localized problems of reputation-based party halls by not always giving students their first choice in housing.

Facilitate Developmental Transitions

The transition into college is a major transition that reflects several important developmental transitions in the identity, affiliation, and achievement domains. To the extent that difficulties with some of these transitions contribute to increased substance use, then efforts to assist in the successful negotiations of these transitions should translate into less substance use. Consistent with the Overload Model, preparing young people in advance of entering college, along with providing support during the many transitions, should serve to increase coping capacities to deal with the stress of multiple simultaneous transitions. Consistent with the Developmental Mismatch Model, ensuring a good match between a young person's expectations about college, and what the college experience can actually provide, would be beneficial as well. At the individual level, students (and their parents) can proactively seek out information about what programs and options are offered so that the student can position him or herself in a campus and living situation that provide the needed levels of support and opportunities. Institutions can seek to provide varied possibilities for students (e.g., theme-based housing) and to communicate clearly what these options are.

However, as noted in the Transition Catalyst model, plans to drink and even binge drink may be fundamental parts of some new students' goals for their college experience. Therefore, institutions are faced with the significant challenge of continually attempting to provide students with what they actually need (e.g., intellectual and social stimulation) and not what students think they want (e.g., "the best parties of their lives!"). Practically, older adolescent students need engaging and interesting things to do on weekends, especially at night. Based on our understanding of normative developmental tasks of this time of life, it is clear that students are highly motivated to make friends, meet exciting people, and have fun (Cantor & Langston, 1989). If bars and parties are where all the weekend activity is happening, this will represent a powerful lure to many. Clearly, students need to be centrally involved in any alternative "programming," as even the best administrator is unlikely to be able to keep up to date with changing trends in entertainment and leisure preferences.

Intervene at Levels of Individual, Context, and/or Individual-Context Match

Perhaps the most common prevention and intervention strategies have targeted individuals, aiming to alter their knowledge, attitudes, and/or behavior. Such strategies can effect meaningful and significant change, but given that individuals are embedded in their contexts, it is also possible to effect individual-level change by intervening at the context level (Maggs et al., 1997). Common examples of potential contextual targets for alcohol intervention include changing group social norms (e.g., perceived acceptability of alcohol-induced vomiting in a residence hall), altering laws and penalties for breaking them (e.g., recent legislative changes that permit parents to be notified of on-campus alcohol/drug infractions), and changes in marketing and sales practices (e.g., server training; Happy Hours provide free food instead of cheap drinks) (Bennett, Murphy, & Bunton, 1992; Grossman, Chaloupka, Saffer, & Laixuthai, 1994; Noack, 1987). Consistent with the Developmental Mismatch Model, broader-based contextual interventions are also recommended, especially ones that attempt to increase the match between individuals and their contexts (e.g., classes/programs that attend to unique needs, co-op and apprenticeship programs that permit students some advance real-life experiences and training in their desired major/profession).

It is important to remember that adapting to transitions is a fundamental, normative, and healthy aspect of development. Although transitions can be demanding and difficult, it is through such challenges that individuals grow and develop, acquiring more complex and advanced characteristics, capabilities, and competencies. For example, moving from the relatively monolithic role of high school student to the diversity of post-high school experiences is associated with increased self-esteem (e.g., Aseltine & Gore, 1993; Bachman et al., 1978; Schulenberg, et al., 2000). Gaining a better understanding of how the world works, a firmer grasp on logic and cause–effect relationships, broader access to social support, and greater control over one's social context will likely increase one's ability to avoid or alter behaviors detrimental to one's health.

Content and Level of Interventions Should Be Developmentally Appropriate

As argued throughout this paper, to understand adolescent and young adult substance use, it is essential to consider the place of alcohol and other drugs in the context of individuals' changing lives. Because of the many pervasive and fundamental developmental

transitions that occur during the college years, and because of great interindividual variability in the timing, sequence, and importance of various changes, efforts aimed at older adolescent/young adult students need to be sensitive to these important within- and between-person variations. Interventions need to take into account what is known about normative developmental changes and concerns of this population. As a group, college students have powerful needs and desires for simultaneously building social lives, forming romantic and sexual attachments, maintaining positive relationships with their families of origin, succeeding academically, deciding on and working towards a career, and just managing the organization of their complex daily lives.

To achieve "developmentally appropriate" programs and policies that seem both appealing and reasonable to young adults, students themselves should be partners in the process. We know that it is unlikely that the simple upward extension of programs that were successful for younger adolescents will be effective with college students. Administrators and researchers alike need a better understanding of the student perspective: What aspects of college drinking do they view as problematic? What would motivate and/or help them to drink in moderation rather than to excess?

Balance Increased Freedoms with Increased Responsibilities

A defining feature of human growth and adaptation is the quest for increased mastery over oneself and the environment, and optimal development occurs when one has opportunities for and success in gaining increased mastery (e.g., Bandura, 1982b; Harter, 1999; Heckhausen, 1999). This quest for increased mastery can be viewed in terms of increased freedoms and responsibilities. The balance between freedoms and responsibilities is crucial, in that too much of one relative to the other can thwart the progression toward increased mastery. The transition from adolescence to young adulthood, and particularly into college, is a time when many individuals have more personal freedom than responsibility, and more peers in the same situation, thus providing some opportunity for previous casual substance use to be transformed into heavier and/or more frequent use (Bachman et al., 1997). At the same time, the social role ambiguity and transience that are characteristic of the transition for many young people do little to engender commitment and conformity to social conventions, and thus may implicitly encourage heavy drinking by creating an imbalance of increased personal freedoms without parallel social responsibilities (e.g., see Sampson & Laub, 1993; Schulenberg, O'Malley, et al., 1996).

Possible solutions include slowing down the pace of increased freedoms during the transition (e.g., by having dorm curfews for first-year students), and of increasing social responsibilities through community work (e.g., Youniss & Yates, 1997). Recent federal policy changes that permit parental notification in the case of under-age-21 students' alcohol and drug violations represent one strategy that may assist parents to monitor on-campus behavior of their children. While it is hoped that this policy will serve to increase responsible behavior on the part of college students, it may also serve to support the view that college students are not yet adults and thus postpone responsible behavior on their part. Another strategy is to proactively modify the image or reputation that attracts prospective students to a particular institution, campus, or residence hall. Schools and halls that develop a reputation as being social or party-oriented will attract students seeking these experiences (and may influence other students to enroll elsewhere). Recruiting and orientation leaders

(particularly student leaders) may perpetuate or help change such reputations for the better by formally presented information as well as casual remarks.

Alcohol-Specific Programming Implications

Reduce Negative Consequences of Heavy Drinking

In the introduction, we discussed how embedded heavy drinking is in the transition to young adulthood in general, and the college experience in particular. That is, binge drinking rates among college students over the past two decades have changed little, representing virtually the only substance use rate (for the total young adult population and for subgroups) that has remained relatively flat. Again, as we mentioned in the introduction, this is not to justify heavy drinking, nor is it to convey a sense of pessimism about the likelihood of ever reducing the high rates of binge drinking among college students. Systematic and broad-based programs and policy changes may well set in motion forces that will significantly decrease the rates over the long-term, and specific campuses may be able to effect more localized change in the shorter-term. Nevertheless, we must recognize that in many cases, the odds of significantly altering the national binge drinking rates among college students in the short term are low. This underscores the importance of reducing the negative consequences of heavy drinking for some (i.e., harm reduction) (e.g., Marlatt, 1998), and working to connect others who have more chronic alcohol problems with health care networks earlier than middle adulthood. Consistent with the Heightened Vulnerability to Chance Events Model, an adaptive strategy in negotiating the transition to college is to explore one's new contexts as well as one's identity in relation to the new contexts. This adaptive exploration will likely increase the odds of unpredicted events. Therefore, it is importance to prepare young people in advance for such chance encounters and accompanying potential negative consequences. Practical ideas for reducing negative consequences of heavy drinking include providing condoms in all residence halls and cafes/bars near campus, transportation to avoid unsafe driving, and excellent security on campus (especially at night and at parties).

Target Interventions According to Likely Course of Heavy Drinking

Consistent with the Increased Heterogeneity Model, developmental transitions can serve to exacerbate individual differences in functioning and adjustment, with those having difficulties prior to the transition experiencing increased problems. Adolescents with extensive alcohol and other drug use histories prior to entering college are likely to be at risk for adjustment difficulties in general, and are unlikely to be influenced by some of the standard prevention efforts. Of course, identifying such students in advance poses some logistic and ethical dilemmas, but once such students are identified (e.g., through student services), offering more intensive targeted interventions might prove useful (e.g., Darkes & Goldman, 1993). In contrast, for those young people who are on an experimental developmentally limited trajectory of heavy drinking and other substance use (Schulenberg, 1999; Schulenberg, O'Malley et al., 1996), college adjustment problems may be neither a cause nor a consequence of their substance use, and intensive personal interventions might prove counterproductive. When students in this experimental category are identified (e.g., interviewed by a student services counselor or disciplinary administrator), high quality

diversion programs or harm reduction approaches (see above) may prove effective (e.g., Marlatt et al., 1995).

SUMMARY AND CONCLUSIONS

Alcohol use and heavy drinking during the transition from adolescence to young adulthood often reflect normative, purposeful behaviors that when viewed from the young person's perspective may serve more of a constructive role than destructive one. To reconcile this relatively sanguine view with fact that, for many young people, heavy drinking becomes problematic is difficult, but necessary. By understanding how alcohol use fits in young people's lives, we can have a stronger foundation for attempting to counter the negative consequences and personal tragedies that all too often result from heavy drinking.

In this paper, we offer a developmental perspective that emphasizes how alcohol and other drug use among young people are embedded within the many developmental transitions that take place during adolescence and young adulthood. Developmental transitions during this time include fundamental biological (e.g., pubertal) and cognitive changes; transitions in affiliations with the family of origin, peers, and romantic partners; identity transitions; and achievement (school and work) transitions. As we have argued, these developmental transitions offer important vantage points for examining increasing (and decreasing) substance use and other health risks during adolescence and young adulthood (see Table 2). Five interrelated conceptual models were presented that depict alternative ways in which developmental transitions relate to health risks, including: (1) Overload Model (health risks are viewed as a potential but not inevitable result of experiencing multiple developmental transitions); (2) Developmental Mismatch Model (health risks and opportunities are viewed as a result of the impact of developmental transitions on the developmental or goodness-of-fit between individuals and their contexts); (3) Increased Heterogeneity Model (developmental transitions are viewed as moderators of ongoing health risk status); (4) Transition Catalyst Model (substance use and risk taking in general can be viewed as important components of negotiating certain developmental transitions); and (5) Heightened Vulnerability to Chance Events Model (developmental transitions can increase effects of chance events) (see Table 1). In addition to discussing implications for research on substance use etiology and prevention, we summarized selected program and policy implications, focusing both on broader developmental intervention implications as well as alcohol-specific programming implications.

Understanding how substance use relates to developmental transitions, including how individual characteristics and contextual features serve to moderate this relationship, provides an essential foundation for attempts to effect lasting change in young people. The many transitions that occur during adolescence represent windows of opportunity for changing behaviors for the better. By redirecting potentially risky trajectories, successful developmental interventions can not only assist in the resolution of immediate difficulties, they can also set the stage for continued enhanced health and well-being across the life span.

REFERENCES

Alan Guttmacher Institute. (1994). *Sex and America's teenagers*. New York: Author.

Arnett, J. J. (1999). Adolescent storm and stress, reconsidered. *American Psychologist, 54*, 317-326.

Arnett, J. J. (2000). Emerging adulthood—A theory of development from the late teens through the twenties. *American Psychologist 55*(5), 469-480.

Aseltine, R. H., & Gore, S. (1993). Mental health and social adaptation following the transition from high school. *Journal of Research on Adolescence, 3*, 247-270.

Babor, T. F., Hofmann, M., DelBoca, F. K., Hesselbrock, V. M., Meyer, R. E., Dolinsky, Z. S., & Rounsaville, B. (1992). Types of alcoholics: I. Evidence for an empirically derived typology based on indicators of vulnerability and severity. *Archives of General Psychiatry, 49*, 599-608.

Bachman, J. G., O'Malley, P. M., & Johnston, L. D. (1978). *Youth in transition: Vol. 6. Adolescence to adulthood: A study of change and stability in the lives of young men*. Ann Arbor, MI: Institute for Social Research.

Bachman, J. G., & Schulenberg, J. (1993). How part-time work intensity relates to drug use, problem behavior, time use, and satisfaction among high school seniors: Are these consequences, or merely correlates? *Developmental Psychology, 29*, 220-235.

Bachman, J. G., Wadsworth, K. N., O'Malley, P. M., Johnston, L. D., & Schulenberg, J. (1997). *Smoking, drinking, and drug use in young adulthood: The impact of new freedoms and new responsibilities*. Mahwah, NJ: Lawrence Erlbaum.

Baer, J. S. (1993). Etiology and secondary prevention of alcohol problems with young adults. In J. S. Baer, G. M. Marlatt, & R. J. McMahon (Eds.), *Addictive behaviors across the life span: Prevention, treatment, and policy issues* (pp. 111-137). Newbury Park, CA: Sage.

Baer, J. S., & Carney, M. M. (1993). Biases in the perceptions of the consequences of alcohol use among college students. *Journal of Studies on Alcohol, 54*, 54-60.

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611-626.

Bandura, A. (1982a). The psychology of chance encounters and life paths. *American Psychologist, 37*, 747-755.

Bandura, A. (1982b). Self-efficacy mechanisms in human agency. *American Psychologist, 37*, 122-147.

Bandura, A. (1998). Exploration of fortuitous determinants of life paths. *Psychological Inquiry, 9*, 95-8.

Bank, B. J., Slavings, R. L., & Biddle, B. J. (1990). Effects of peer, faculty, and parental influences on students' persistence. *Sociology of Education, 63*, 208-225.

Barkely, R., Anastopoulos, A., Guevremont, D., & Fletcher, K. (1991). Adolescents with ADHD: Patterns of behavioral adjustment, academic functioning, and treatment utilization. *Journal of American Academy of Child and Adolescent Psychiatry, 30*, 752-761

Bates, M. E., & Labouvie, E. W. (1997). Adolescent risk factors and the prediction of persistent alcohol and drug use into adulthood. *Alcoholism: Clinical & Experimental Research, 21*, 944-950.

Baumrind, D. (1987). A developmental perspective on adolescent risk taking in contemporary America. In C.E. Irwin, Jr. (Ed.), *Adolescent social behavior and health* (pp. 93-125). San Francisco: Jossey-Bass.

Benedict, R. (1950). *Patterns of culture*. New York: New American Library.

Bennett, P., Murphy, S., & Bunton, R. (1992). Preventing alcohol problems using healthy public policy. *Health Promotion International, 7*, 297-306.

Berndt, T. J. (1992). Friendship and friends' influence in adolescence. *Current Directions in Psychological Science, 1*, 156-159.

Berndt, T. J., Hawkins, J. A., & Jiao, Z. (1999). Influences of friends and friendships on adjustment to junior high school. *Merrill-Palmer Quarterly, 45*, 13-41.

Berndt, T. J., & Mekos, D. (1995). Adolescents' perceptions of the stressful and desirable aspects of the transition to junior high school. *Journal of Research on Adolescence, 5*, 123-142.

Beyth-Marom, R., Austin, L., Fischhoff, B., Palmgren, C., & Jacobs-Quadrel, M. (1993). Perceived consequences of risky behaviors: Adults and adolescents. *Developmental Psychology, 29*, 549-563.

Beyth-Marom, R., & Fischhoff, B. (1997). Adolescents' decisions about risks: A cognitive perspective. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 110-135). New York: Cambridge University Press.

Blane, H. T. (1979). Middle-aged alcoholics and young drinkers. In H. T. Blane & M. E. Chafetz (Eds.), *Youth, alcohol, & social policy* (pp. 5-38). New York: Plenum.

Blos, P. (1970). *The young adolescent: Clinical studies*. New York: Free Press.

Blustein, D. L., Walbridge, M. M., Friedlander, M. L., & Palladino, D. E. (1991). Contributions of psychological separation and parental attachment to the career development process. *Journal of Counseling Psychology, 38*, 39-50.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Brook, J. S., Cohen, P., Whiteman, M., & Gordon, A. S. (1992). Psychosocial risk factors in the transition from moderate to heavy use or abuse of drugs. In M. Glantz & R. Pickens (Eds.), *Vulnerability to drug abuse* (pp. 359-388). Washington, DC: American Psychological Association.

Brook, J. S., & Newcomb, M. D. (1995). Childhood aggression and unconventionality: Impact on later academic achievement, drug use, and workforce involvement. *Journal of Genetic Psychology, 156*, 393-410.

Brooks-Gunn, J., & Paikoff, R. (1993). Sex is a gamble, kissing is a game: Adolescent sexuality, contraception, and pregnancy. In S. G. Millstein, A. C. Petersen, & E. O. Nightingale (Eds.) *Promoting the health of adolescents: New directions for the twenty-first century* (pp. 180-208). New York: Oxford University Press.

Brooks-Gunn, J., & Paikoff, R. L. (1997). Sexuality and developmental transitions during adolescence. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 190-219). New York: Cambridge University Press.

Brown, B. B., Dolcini, M. M., & Leventhal, A. (1997). Transformations in peer relationships at adolescence: Implications for health-related behavior. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 161-189). New York: Cambridge University Press.

Cairns, R. B., & Cairns, B. D. (1994). *Lifelines and risks: Pathways of youth in our time*. New York: Cambridge University Press.

Cairns, R. B., Cairns, B. D., Rodkin, P., & Xie, H. (1998). New directions in developmental research: Models and methods. In R. Jessor (Ed.), *New perspectives on adolescent risk behavior* (pp. 13-40). Cambridge, UK: Cambridge University Press.

Caldwell, C. H., & Antonucci, T. C. (1997). Childbearing during adolescence: Mental health risks and opportunities. In J. Schulenberg, J.L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 220-245). New York: Cambridge University Press.

Cantor, N., & Langston, C. A. (1989). Ups and downs of life tasks in a life transition. In L. A. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 127-167). Hillsdale, NJ: Lawrence Erlbaum.

Caspi, A., Elder, G. H. Jr., & Bem, D. J. (1988). Moving away from the world: Life-course patterns of shy children. *Developmental Psychology, 24*, 824-831.

Caspi, A., & Moffitt, T. E. (1993). When do individual differences matter? A paradoxical theory of personality coherence. *Psychological Inquiry, 4*, 247-271.

Chassin, L. (1984). Adolescent substance use and abuse. *Advances in Child Behavioral Analysis and Therapy, 3*, 99-152.

Chassin, L., Presson, C. C., & Sherman, S. J. (1989). "Constructive" vs. "destructive" deviance in adolescent health-related behaviors. *Journal of Youth and Adolescence, 18*, 245-262.

Chassin, L., Tetzloff, C., & Hershey, M. (1985). Self-image and social-image factors in adolescent alcohol use. *Journal of Studies on Alcohol, 46*, 39-47.

Cicchetti, D. (1999). A developmental psychopathology perspective on drug abuse. In M. D. Glantz & C. R. Hartel (Eds.), *Drug abuse: Origins & interventions* (pp. 97-117). Washington DC: American Psychological Association.

Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development & Psychopathology, 8*, 597-600.

Clausen, J. A. (1991). Adolescent competence and the shaping of the life course. *American Journal of Sociology, 96*, 805-842.

Clayton, R. R. (1992). Transitions in drug use: Risk and protective factors. In M. D. Glantz & R. Pickens (Eds.) *Vulnerability to drug abuse* (pp. 15-51). Washington, DC: American Psychological Association.

Cloninger, C. R. (1987). Neurogenetic adaptive mechanisms and alcoholism. *Science, 236*, 410-416.

Cloninger, C. R., Svrakic, N. M., & Svrakic, D. M. (1997). Role of personality self-organization in development of mental order and disorder. *Development & Psychopathology, 9*, 881-906.

Coie, J. D., Watt, N. F., West, S. G., Hawkins, J. D., Asarnow, J. R., Markman, H. J., Ramey, S. L., Shure, M. B., & Long, B. (1993). The science of prevention: A conceptual framework and some directions for a national research program. *American Psychologist, 48*, 1013-1022.

Coleman, J. C. (1989). The focal theory of adolescence: A psychological perspective. In K. Hurrelmann & U. Engel (Eds.), *The social world of adolescents: International perspectives* (pp. 43-56). Berlin: Walter de Gruyter.

Compas, B. E. (1995). Promoting successful competence during adolescence. In M. Rutter (Ed.), *Psychosocial disturbances in young people: Challenges for prevention* (pp. 247-273). New York: Cambridge University Press.

Compas, B. E., Wagner, B. M., Slavin, L. A., & Vannatta, K. (1986). A prospective study of life events, social support, and psychological symptomatology during the transition from high school to college. *American Journal of Community Psychology, 14*, 241-257.

Conger, R. D. & Rueter, M. A. (1996). Siblings, parents, and peers: A longitudinal study of social influences in adolescent risk for alcohol use and abuse. In G. H. Brody et al. (Ed.), *Sibling relationships: Their causes and consequences* (pp. 1-30). Norwood, NJ: Ablex Publishing Corp.

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology, 69*, 990-1005.

Cooper, M. L., & Orcutt, H. K. (1997). Drinking and sexual experience on first dates among adolescents. *Journal of Abnormal Psychology, 106*, 191-202.

Cooper, M. L., Shapiro, C. M., Powers, A. M. (1998). Motivations for sex and risky sexual behavior among adolescents and young adults: A functional perspective. *Journal of Personality and Social Psychology, 75*, 1528-1558.

Crockett, L. J. (1997). Cultural, historical, and subcultural contexts of adolescence: Implications for health and development. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 23-53). New York: Cambridge University Press.

Crockett, L. J., & Crouter, A. C. (Eds.) (1995). *Pathways through adolescence: Individual development in relation to social contexts*. Mahwah, NJ: Lawrence Erlbaum.

Curran, P. J., & Muthen, B. O. (1999). The application of latent curve analysis to testing developmental theories in intervention research. *American Journal of Community Psychology, 27*, 567-595.

Cutrona, C. E., Cole, V., Colangelo, N., Assouline, S. G., & Russell, D. W. (1994). Perceived parental social support and academic achievement: An attachment theory perspective. *Journal of Personality and Social Psychology, 66*, 369-378.

D'Amico, E. J., & Fromme, K. (1997). Health risk behaviors of adolescent and young adult siblings. *Health Psychology, 16*, 426-432.

Damphousse, K. R., & Kaplan, H. B. (1998). Intervening processes between adolescent drug use and psychological distress: An examination of the self-medication hypothesis. *Social Behavior & Personality, 26*, 115-30.

Darkes, J., & Goldman, M. S. (1993). Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology, 61*, 344-353.

Dermen, K. H., & Cooper, M. L. (1994). Sex-related alcohol expectancies among adolescents: II. Prediction of drinking in social and sexual situations. *Psychology of Addictive Behaviors, 8*, 161-168.

Dermen, K. H., Cooper, M. L., & Agocha, V. B. (1998). Sex-related alcohol expectancies as moderators of the relationship between alcohol use and risky sex in adolescents. *Journal of Studies on Alcohol, 59*, 71-77.

Dielman, T. (1994). School-based research on the prevention of adolescent alcohol use and misuse: Methodological issues and advances. *Journal of Research on Adolescence, 4*, 271-293.

Dishion, T. J., Capaldi, D. M., & Yoerger, K. (1999). Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection. *Journal of Adolescent Research, 14*, 175-205.

Dishion, T. J., McCord, J., & Poulin, F. (1999). When interventions harm: Peer groups and problem behavior. *American Psychologist, 54*, 755-764.

Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*, 890-904

Donovan, J. E., Jessor, R., & Jessor, L. (1983). Problem drinking in adolescence and young adulthood: A follow-up study. *Journal of Studies on Alcohol, 44*, 109-137.

Douvan, E., & Adelson, J. (1966). *The adolescent experience*. New York: Wiley.

Duncan, S. C., Alpert, A., Duncan, T. E., & Hops, H. (1997). Adolescent alcohol use development and young adult outcomes. *Drug and Alcohol Dependence, 49*, 39-48.

Duncan, T. E., Duncan, S. C., Hops, H. (1996). The role of parents and older siblings in predicting adolescent substance use: Modeling development via structural equation latent growth methodology. *Journal of Family Psychology, 10*, 158-172.

Dunn, M. E., & Goldman, M. S. (1996). Empirical modeling of an alcohol expectancy memory network in elementary school children as a function of grade. *Experimental and Clinical Psychopharmacology, 4*, 209-217.

Eccles, J. S., Lord, S. E., Roeser, R. W., Barber, B., & Jozefowicz, D. M. H. (1997). The association of school transitions in early adolescence with developmental trajectories through high school. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 283-320). New York: Cambridge University Press.

Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & MacIver, D. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist, 48*, 90-101.

Eddy, J. M., Dishion, T. J., & Stoolmiller, M. (1998). The analysis of intervention change in children and families: Methodological and conceptual issues embedded in intervention studies. *Journal of Abnormal Child Psychology, 26*, 53-69.

Eggert, L. L., Thompson, E. A., Herting, J. R., & Nicholas, L. J. (1994). Preventing adolescent drug abuse and high school dropout through an intensive school-based social network development program. *American Journal of Health Promotion, 8*, 202-215.

Elder, G. H., Jr. (1998). The life course and human development. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (pp. 939-991). New York: Wiley.

Elkind, D. (1967). Egocentrism in adolescence. *Child Development, 38*, 1025-1034.

Ellickson, P. L., & Hays, R. D. (1991). Antecedents of drinking among young adolescents with different alcohol use histories. *Journal of Studies on Alcohol, 52*, 398-408.

Elliott, D. S., Huizinga, D., & Menard, S. (1989). *Multiple problem youth: Delinquency, substance use, and mental health problems*. New York: Springer-Verlag.

Entwisle, D. R. (1990). Schools and the adolescent. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 197-224; 548-555). Cambridge, MA: Harvard University Press.

Erikson, E. H. (1950). *Childhood and society*. New York: Norton.

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.

Featherman, D. L. (1983). Life-span perspectives in social science research. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior: Vol. 5* (pp. 1-59). New York: Academic Press.

Fillmore, K. M., Johnstone, B. M., Leino, E. V., & Ager, C. R. (1993). A cross-study contextual analysis of effects from individual-level drinking and group-level drinking factors: A meta-analysis of multiple longitudinal studies from the Collaborative Alcohol-Related Longitudinal Project. *Journal of Studies on Alcohol, 54*, 37-47.

Finch, M. D., Mortimer, J. T., & Ryu, S. (1997). Transition into part-time work: Health risks and opportunities. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 321-344). New York: Cambridge University Press.

Fisher, L. A., & Bauman, K. E. (1988). Influence and selection in the friend adolescent relationship: Findings from studies of adolescent smoking and drinking. *Journal of Applied Social Psychology, 18*, 289-314.

Flay, B., & Petraitis, J. (1994). The theory of triadic influence: A new theory of health behavior with implications for preventive interventions. *Advances in Medical Sociology, 4*, 19-44.

Freud, A. (1958). Adolescence. *Psychoanalytic Study of the Child, 13*, 255-278.

Friedman, H. L. (1993). Adolescent social development: A global perspective. *Journal of Adolescent Health, 14*, 588-594.

Furby, L., & Beyth-Marom, R. (1992). Risk-taking in adolescence: A decision-making perspective. *Developmental Review, 12*, 1-44.

Galambos, N. L., & Ehrenberg, M. F. (1997). The family as health risk and opportunity: A focus on divorce and working families. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.),*Health risks and developmental transitions during adolescence* (pp. 139-160). New York: Cambridge University Press.

Galambos, N. L., Kolaric, G. C., Sears, H. A., & Maggs, J. L. (1999). Adolescents' subjective age: An indicator of phenomenological maturity. *Journal of Research of Adolescence, 9*, 309-337.

Garmezy, N. (1983). Stressors of childhood. In N. Garmezy & M. Rutter (Eds.), *Stress, coping, and development in children* (pp. 43-84). New York: McGraw Hill.

Garmezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development, 55*, 97-111.

Gilligan, C. (1977). In a different voice: Women's conception of the self and of morality. *Harvard Educational Review, 47*, 481-517.

Glantz, M. D., Weinberg, N. Z., Miner, L. L., & Colliver, J. D. (1999). The etiology of drug abuse: Mapping the paths. In M. D. Glantz & C. R. Hartel (Eds.), *Drug abuse: Origins & interventions* (pp. 3-45). Washington DC: American Psychological Association.

Goldman, M. S. (1994). The alcohol expectancy concept: Applications to assessment, prevention, and treatment of alcohol abuse. *Applied and Preventive Psychology, 3*, 131-144.

Goldman, M. S., Brown, S. A., & Christiansen, B. A. (1987). Expectancy theory: Thinking about drinking. In H. T. Blane & K. E. Leonard (Eds.), *Psychological theories of drinking and alcoholism* (pp. 181-226). New York: Guilford.

Goldman, M. S., Del Boca, F. K., & Darkes, J. (1999). Alcohol expectancy theory: The application of cognitive neuroscience. In K. E. Leonard & H. T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (pp. 203-246). New York: Guilford Press.

Gore, S., Aseltine, R., Jr., Colten, M. E., & Lin, B. (1997). Life after high school: Development, stress, and well-being. In I. H. Gotlib (Ed), *Stress and adversity over the life course: Trajectories and turning points* (pp 197-214). New York: Cambridge University Press.

Gotham, H. J., Sher, K. J., & Wood, P. K. (1997). Predicting stability and change in frequency of intoxication from the college years to beyond: Individual-difference and role transition variables. *Journal of Abnormal Psychology, 106*, 619- 629.

Gottlieb, G. (1991). Experiential canalization of behavioral development: Theory. *Developmental Psychology, 27*, 4-13.

Graber, J. A., Brooks-Gunn, J., & Galen, B. R. (1998). Betwixt and between: Sexuality in the context of adolescent transitions. In R. Jessor (Ed.), *New perspectives on adolescent risk behavior* (pp. 270-316). New York: Cambridge University Press.

Greenberger, E., & Steinberg, L.D. (1986). *When teenagers work*. New York: Basic Books.

Grossman, M., Chaloupka, F. J., Saffer, H., & Laixuthai, A. (1994). Effects of alcohol price policy on youth: A summary of economic research. *Journal of Research on Adolescence, 4*, 347-364

Grotevant, H. D. (1987). Toward a process model of identity formation. *Journal of Adolescent Research, 2*, 203-222.

Grotevant, H. D. (1997). Identity processes: Integrating social psychological and developmental approaches. *Journal of Adolescent Research, 12*, 354-357.

Hall, G. S. (1904). *Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education* (Volume I and II). Englewood Cliffs, NJ: Prentice Hall.

Hamburg, D. A., Millstein, S. G., Mortimer, A. M., Nightingale, E. O., & Petersen, A. C. (1993). Adolescent health promotion in the twenty-first century: Current frontiers and new directions. In S. G. Millstein, A. C. Petersen, & E. O. Nightingale (Eds.), *Promoting the health of adolescents: New directions for the twenty-first century*. New York: Oxford University Press.

Hamilton, S. F. (1994). Employment prospects as motivation for school achievement: Links and gaps between school and work in seven countries. In R.K. Silbereisen and E. Todt (Eds.), *Adolescence in context: The interplay of family, school, peers, and work in adjustment* (pp. 267-283). New York: Springer-Verlag.

Harter, S. (1999). *The construction of the self : A developmental perspective*. New York: Guilford Press.

Havighurst, R. (1952). *Developmental tasks and education*. New York: McKay.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*, 64-105.

Hays, R. B., & Oxley, D. (1986). Social network development and functioning during a life transition. *Journal of Personality & Social Psychology, 50*, 305-313.

Heckhausen, J. (1999). *Developmental regulation in adulthood: Age-normative and sociostructural constraints as adaptive challenges*. New York: Cambridge University Press.

Hesselbrock, V. M., O'Brien, J., Weinstein, M., & Carter-Menendez, N. (1987). Reasons for drinking and alcohol use in young adults at high risk and at low risk for alcoholism. *British Journal of Addiction, 82*, 1335-1339.

Hilton, M. E. (1991). The demographic distribution of drinking problems in 1984. In W. B. Clark & M. E. Hilton (Eds.), *Alcohol in America: Drinking practices and problems* (pp. 87-101). Albany, NY: State University of New York Press.

Hogan, D. P., & Astone, N. M. (1986). The transition to adulthood. *Annual Review of Sociology, 12*, 109-130.

Hops, H., Davis, B., & Lewin, L. M. (1999). The development of alcohol and other substance use: A gender study of family and peer context. *Journal of Studies on Alcohol, 13*, 22-31.

Irwin, C. E., Jr., & Millstein, S. G. (1992). Risk-taking behaviors and biopsychosocial development during adolescence. In E. J. Susman, L. V. Feagans, & W. J. Ray (Eds.), *Emotion, cognition, health, and development in children and adolescents* (pp. 75-102). Hillsdale, NJ: Lawrence Erlbaum.

Jessor, R. (1984). Adolescent development and behavioral health. In J. D. Matarazzo & C. L. Perry (Eds.), *Behavioral health: A handbook of health enhancement and disease prevention* (pp. 69-90). New York: Wiley.

Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction, 82*, 331-342.

Jessor, R. (1992). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Developmental Review, 12*, 374-390.

Jessor, R., Donovan, J. E., & Costa, F. (1991). *Beyond adolescence: Problem behavior and young adult development*. New York: Cambridge University.

Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychological development: A longitudinal study of youth*. New York: Academic Press.

Johnson, P. B., & Johnson, H. L. (1996). Children's beliefs about the social consequences of drinking and refusing to drink alcohol. *Journal of Alcohol and Drug Education, 41*, 34-43.

Johnson, P. B., & Johnson, H. L. (1999). Cultural and familial influences that maintain the negative meaning of alcohol. *Journal of Studies on Alcohol, 13*, 79-83.

Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (1999). *National survey of results on drug use from the Monitoring the Future study, 1975-1998*. Rockville, MD: U.S. Department of Health and Human Services.

Jones, R. M. (1992). Ego identity and adolescent problem behavior. In G. R. Adams, T. P. Gullotta, & R. Montemayor (Eds.), *Adolescent identity formation*. Newbury Park, CA: Sage.

Kandel, D. B. (1978). Homophily, selection, and socialization in adolescent friendships. *American Journal of Sociology, 84*, 427-436.

Kandel, D. B. (1985). On processes of peer influences in adolescent drug use: A developmental perspective. *Advances in Alcohol & Substance Abuse, 4*, 139-163.

Kandel, D., Davies, M., & Baydar, N. (1990). The creation of interpersonal contexts: Homophily in dyadic relationships in adolescence and young adulthood. In L. Robins & M. Rutter (Eds.), *Straight and devious pathways from childhood to adulthood*. Cambridge, UK: Cambridge University Press.

Kandel, D. B., & Raveis, V. H. (1989). Cessation of illicit drug use in young adulthood. *Archives of General Psychiatry, 46*, 109-116.

Kaplan, H. B. (1985). Testing a general theory of drug abuse and other deviant adaptations. *Journal of Drug Issues, 15*, 477-492.

Kazdin, A. E. (1993). Adolescent mental health: Prevention and treatment programs. *American Psychologist, 48*, 127-141.

Keating, D. P. (1990). Adolescent thinking. In S. S. Feldman & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 54-89). Cambridge, MA: Harvard University Press.

Kellam, S. G., Koretz, D., & Moscicki, E. K. (1999). Core elements of developmental epidemiologically based prevention research. *American Journal of Community Psychology, 27*, 463-482.

Kellam, S. G., & Rebok, G. W. (1992). Building developmental and etiological theory through epidemiologically based preventive intervention trials. In J. McCord & R. E. Tremblay (Eds.), *Preventing antisocial behavior: Interventions from birth through adolescence* (pp. 162-195). New York: Guilford.

Kenny, M. E. (1987). Family ties and leaving home for college: Recent findings and implications. *Journal of College Student Personnel, 28*, 438-442.

Kohlberg, L. (1969). Stage and sequence: The cognitive-developmental approach to socialization. In D. A. Goslin (Ed.), *Handbook of socialization theory and research*. Chicago: Rand-McNally.

Larson, R. W., Richards, M. H., Moneta, G., Holmbeck, G., & Duckett, E. (1996). Changes in adolescents' daily interactions with their families from ages 10 to 18: Disengagement and transformation. *Developmental Psychology, 32*, 744-754.

Leigh, B. C., & Stacy, A. W. (1993). Alcohol outcome expectancies: Scale construction and predictive utility in higher order confirmatory models. *Psychological Assessment, 5*, 216-229.

Leonard, K. E., & Rothbard, J. C. (1999). Alcohol and the marriage effect. *Journal of Studies on Alcohol, Special Issue: Alcohol and the family: Opportunities for prevention, 13*, 139-146.

Lerner, R. M. (1982). Children and adolescents as producers of their own development. *Developmental Review, 2*, 342-370.

Lerner, R. M., & Busch-Rossnagel, N. A. (1981). *Individuals as producers of their own development: A life-span perspective*. NY: Academic.

Lerner, R. M., & Kauffman, M. B. (1985). The concept of development in contextualism. *Developmental Review, 5*, 309-333.

Lerner, R. M., Ostrom, C. W., & Freel, M. A. (1997). Preventing health-compromising behaviors among youth and promoting their positive development: A developmental contextual perspective. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 498-521). New York: Cambridge University Press.

Lewin, K. (1939). The field theory approach to adolescence. *American Journal of Sociology, 44*, 868-897.

Loeber, R. (1982). The stability of antisocial and delinquent child behavior: A review. *Child Development, 53*, 1431-1446.

Loeber, R. & Farrington, D. P. (1994). Problems and solutions in longitudinal and experimental treatment studies of child psychopathology and delinquency. *Journal of Consulting and Clinical Psychology, 62*, 887-900.

MacKinnon, D. P. (1994). Analysis of mediating variables in prevention and intervention research. In A. Cazeres & L. A. Beatty (Eds.), *Scientific methods for prevention research* (pp.127-154). National Institute on Drug Abuse Monograph #139. Rockville, MD: National Institute on Drug Abuse.

Maggs, J. L. (1997). Alcohol use and binge drinking as goal-directed action during the transition to post-secondary education. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 345-371). New York: Cambridge University Press.

Maggs, J. L., Almeida, D. M., & Galambos, N. L. (1995). Risky business: The paradoxical meaning of problem behavior for young adolescents. *Journal of Early Adolescence, 15*, 344-362.

Maggs, J. L., & Hurrelmann, K. (1998). Do substance use and delinquency have differential associations with adolescents' peer relations? *International Journal of Behavioral Development, 22*, 367-388.

Maggs, J. L., & Schulenberg, J. (1998). Reasons to drink and not to drink: Altering trajectories of drinking through an alcohol misuse prevention program. *Applied Developmental Science, 2*, 48-60.

Maggs, J. L., & Schulenberg, J. (2001). Editors' introduction: Prevention as altering the course of development and the complementary purposes of developmental and prevention sciences. *Applied Developmental Science, 5*(4), 196-200.

Maggs, J. L., Schulenberg, J., Hurrelmann, K. (1997). Developmental transitions during adolescence: Health promotion implications. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 522-546). New York: Cambridge University Press.

Magnusson, D. (Ed.). (1997). *The life span development of individuals: Behavioral, neurobiological, and psychosocial perspectives: A synthesis*. New York: Cambridge University Press.

Magnusson, D., & Cairns, R. B. (1996). Developmental science: Toward a unified framework. In R. B. Cairns, G. H. Elder, Jr., & E. J. Costello (Eds.), *Developmental science* (pp. 7-30). New York: Cambridge University Press.

Magnusson, D., Stattin, H., & Allen, V. (1986). Differential maturation among girls and its relations to social adjustment in a longitudinal perspective. In P. B. Baltes, D. Featherman, & R. Lerner (Eds.), *Life span development and behavior* (Vol. 7). Hillsdale, NJ: Lawrence Erlbaum.

Marcia, J. (1994). Identity and psychotherapy. In S. L. Archer (Ed.), *Interventions for adolescent identity development* (pp. 29-46). Thousand Oaks, CA: Sage.

Marini, M. M. (1987). Measuring the process of role change during the transition to adulthood. *Social Science Research, 16*, 1-38.

Marlatt, G. A. (Ed.). (1998). *Harm reduction: Pragmatic strategies for managing high risk behaviors*. New York: Guilford Press.

Marlatt, G. A., Baer, J. S., & Larimer, M. (1995). Preventing alcohol abuse in college students: A harm-reduction approach. In G. M. Boyd, J. Howard & R. Zucker (Eds.), *Alcohol problems among adolescents: Current directions in prevention research* (pp. 147-172). Hillsdale, NJ: Lawrence Erlbaum.

Marshall, W. (1978). Puberty. In F. Falker & J. Tanner (Eds.), *Human growth* (Vol. 2). New York: Plenum.

McGue, M., & Sharma, A. (1995). Parent and sibling influences on adolescent alcohol use and misuse: Evidence from a U.S. adoption cohort. *Journal of Studies on Alcohol, 57*, 8-18.

McGue, M., Sharma, A., Benson, P. (1996). The effect of common rearing on adolescent adjustment: Evidence from a U.S. adoption cohort. *Developmental Psychology, 32*, 604-613.

Mead, M. (1950). *Coming of age in Samoa*. New York: New American Library.

Mechanic, D. (1983). Adolescent health and illness behavior: Review of the literature and a new hypothesis for the study of stress. *Journal of Human Stress, 9*, 4-13.

Miller, P. M., Smith, G. T., & Goldman, M. S. (1990). Emergence of alcohol expectancies in childhood: A possible critical period. *Journal of Studies on Alcohol, 51*, 343-349.

Millstein, S. G. (1993). A view of health from the adolescent's perspective. In S. G. Millstein, A. C. Petersen, & E. O. Nightingale (Eds.), *Promoting the health of adolescents: New directions for the twenty-first century* (pp. 97-118). New York: Oxford University Press.

Millstein, S. G., Petersen, A. C., & Nightingale, E. O. (Eds.) (1993). *Promoting the health of adolescents: New directions for the twenty-first century*. New York: Oxford University Press.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100*, 674-701.

Moffitt, T. E., Caspi, A., Dickson, N., Silva, P., & Stanton, W. (1996). Childhood-onset versus adolescent-onset antisocial conduct problems in males: Natural history from ages 3 to 18 years. *Development & Psychopathology, 8*, 399-424.

Mortimer, J. T., Finch, M. D., Ryu, S., Shanahan, M. J., & Call, K. T. (1996). The effects of work intensity on adolescent mental health, achievement, and behavioral adjustment: New evidence from a prospective study. *Child Development, 67*, 1243-1261.

Muuss, R. E. (1996). *Theories of adolescence*. (6th ed.). New York: Random House.

Neugarten, B. L. (1979). Time, age, and the life cycle. *American Journal of Psychiatry, 136*, 887-894.

Newcomb, M. (1987). Consequences of teenage drug use: The transition from adolescence to young adulthood. *Drugs and Society, 1*, 25-60.

Newcomb, M. D. (1997). Psychosocial predictors and consequences of drug use: A developmental perspective within a prospective study. *Journal of Addictive Diseases, 16*, 51-89.

Newcomb, M. D., & Bentler, P. M. (1988). Impact of adolescent drug use and social support on problems of young adults: A longitudinal study. *Journal of Abnormal Psychology, 97*, 64-75.

Newcomb, M. D., Scheier, L. M., & Bentler, P. M. (1993). Effects of adolescent drug use on adult mental health: A prospective study of a community sample. *Experimental & Clinical Psychopharmacology, 1*, 215-241.

Noack, H. (1987). Concepts of health and health promotion. In T. Abelin, Z. J. Brzezinski, V. D. L. Carstairs (Eds.), *Measurement in health promotion and protection*. Copenhagen: WHO.

Nurmi, J. E. (1993). Adolescent development in an age-graded context: The role of personal beliefs, goals, and strategies in the tackling of developmental tasks and standards. *International Journal of Behavioral Development, 16*, 169-189.

Nurmi, J. E. (1997). Self-definition and mental health during adolescence and young adulthood. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 395-419). New York: Cambridge University Press.

O'Connor, T. G. & Rutter, M. (1996). Risk mechanisms in development: Some conceptual and methodological considerations. *Developmental Psychology, 32*, 787-795.

Oerter, R. (1986). Developmental tasks through the life span: A new approach to an old concept. In P. B. Baltes, D. L. Featherman, & R. M. Lerner (Eds.), *Life span development and behavior (Vol. 7)* (pp. 233-271). Hillsdale, NJ: Lawrence Erlbaum.

Oetting, E.R., & Beauvais, F. (1986). Peer cluster theory: Drugs and the adolescent. *Journal of Counseling & Development, 65*, 17-22.

Offer, D., Ostrov, E., & Howard, K. I. (1981). *The adolescent: A psychological self-portrait*. New York: Basic Books.

O'Malley, P. M., & Johnston, L. D. (in press). Epidemiology of alcohol and other drug use among college students. *Journal of Studies on Alcohol*.

Palinkas, L. A., Atkins, C. J., Miller, C., & Ferreira, D. (1996). Social skills training for drug prevention in high-risk female adolescents. *Preventive Medicine, 25*, 692-701.

Pandina, R. J., Labouvie, E. W., Johnson, V., & White, H. R. (1990). The relationship between alcohol and marijuana use and competence in adolescence. *Journal of Health and Social Policy, 1*, 89-108.

Pascarella, E. T. & Terenzini, P. T. (1991). *How college affects students : findings and insights from twenty years of research*. San Francisco: Jossey-Bass Publishers.

Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44*, 329-335.

Pepper, S. C. (1942). *World hypotheses: A study of evidence*. Berkeley, CA: University of California Press.

Perkins, H. W., & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues, 26*, 961-974.

Petersen, A. C. (1993). Creating adolescents: The role of context and process in developmental trajectories. *Journal of Research on Adolescence, 3*, 1-18.

Petersen, A. C., Compas, B., Brooks-Gunn, J., Stemmler, M., Ey, S., & Grant, K. (1993). Depression in adolescence. *American Psychologist, 48*, 155-168.

Petersen, A. C., & Leffert, N. (1995). What is special about adolescence. In M. Rutter (Ed.), *Psychosocial disturbances in young people: Challenges for prevention* (pp. 3-36). New York: Cambridge University Press.

Petersen, A. C., Leffert, N., Graham, B., Alwin, J., & Ding, A. (1997). Promoting mental health during the transition to adolescence. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 471-497). New York: Cambridge University Press.

Petraitis, J., Flay, B. R., & Miller, T.Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces of the puzzle. *Psychological Bulletin, 117*, 67-86.

Phinney, J. S., & Kohatsu, E. L. (1997). Ethnic and racial identity development and mental health. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 420-443). New York: Cambridge University Press.

Pipp, S., Jennings, S., Shaver, P., Lamborn, S., & Fischer, K. (1985). Adolescents' themes about the development of their relationships with their parents. *Journal of Personality and Social Psychology, 48*, 991-1001.

Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology, 64*, 243-256.

Quadrel, M. J., Fischhoff, B., & Davis, B. (1993). Adolescent (in)vulnerability. *American Psychologist, 48*, 1-2-116.

Reese, H. W., & Overton, W. F. (1970). Models of development and theories of development. In L. R. Goulet & P. B. Baltes (Eds.), *Life-span developmental psychology: Research and theory* (pp. 115-145). New York: Academic Press.

Rose, R. J. (1998). A developmental behavioral-genetic perspective on alcoholism risk. *Alcohol Health and Research World, 22*, 131-143.

Russell, M. (1990). Prevalence of alcoholism among children of alcoholics. In M. Windle (Ed.), *Children of alcoholics: Critical perspectives* (pp. 9-38). New York: Guilford Press.

Rutter, M. (1989). Isle of Wight revisited: Twenty-five years of child psychiatric epidemiology. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 633-653.

Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. Rolf, A. Mastern, D. Cicchetti, K. H. Nuechterlein & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology*, (pp. 181-214). Cambridge, UK: Cambridge University Press.

Rutter, M. (1994). Beyond longitudinal data: Causes, consequences, changes, and continuity. *Journal of Consulting & Clinical Psychology, 62*, 928-940.

Rutter, M. (1996). Transitions and turning points in developmental psychopathology: As applied to the age span between childhood and mid-adulthood. *International Journal of Behavioral Development, 19*, 603-626.

Rutter, M., Graham, P., Chadwick, O. F., & Yule, W. (1976). Adolescent turmoil: Fact or fiction? *Journal of Child Psychology and Psychiatry and Allied Disciplines, 17*, 35-56.

Sameroff, A. J. (1987). The social context of development. In N. Eisenberg (Ed.), *Contemporary topics in developmental psychology* (pp. 273-291). New York: Wiley.

Sameroff, A. (1995). General systems theories and developmental psychopathology. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 1. Theory and Methods* (pp. 659-695). New York: Wiley & Sons.

Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.

Scales, P. C., & Leffert, N. (1999). *Developmental assets: A synthesis of the scientific research on adolescence research*. Minneapolis, MN: Search Institute.

Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype-environment effects. *Child Development, 54*, 424-435.

Schaie, K. W. (1965). A general model for the study of developmental problems. *Psychological Bulletin, 64*, 92-107.

Schlegel, A., & Barry, H. (1991). *Adolescence: An anthropological inquiry*. New York: Free Press.

Schulenberg, J. (June, 1999). *Binge drinking trajectories before, during, and after college: More reasons to worry from a developmental perspective*. Invited paper presented

at the preconference session on "Adolescence and Alcohol: Implications for College Drinking." The 1999 Conference of the American Psychological Society, Denver, Colorado.

Schulenberg, J., Bachman, J. G., O'Malley, P. M., & Johnston, L. D. (1994). High school educational success and subsequent substance use: A panel analysis following adolescents into young adulthood. *Journal of Health and Social Behavior, 35*, 45-62.

Schulenberg, J., Maggs, J. L., Dielman, T. E., Leech, S. L., Kloska, D. D., Shope, J. T., & Laetz, V. B. (1999). On peer influences to get drunk: A panel study of young adolescents. *Merrill-Palmer Quarterly, 45*, 108-142.

Schulenberg, J., Maggs, J. L., & Hurrelmann, K. (Eds.) (1997a). *Health risks and developmental transitions during adolescence*. New York: Cambridge University Press.

Schulenberg, J., Maggs, J. L. , & Hurrelmann, K. (1997b). Negotiating developmental transitions during adolescence and young adulthood: Health risks and opportunities. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 1-19). New York: Cambridge University Press.

Schulenberg, J., Maggs, J. L., Steinman, K., & Zucker, R.A. (2001). Development matters: Taking the long view on substance abuse etiology and intervention during adolescence. In P. M. Monti, S. M. Colby, & T. A. O'Leary (Eds.), *Adolescents, alcohol, and substance abuse: Reaching teens through brief intervention* (pp. 19-57). New York: Guilford Press.

Schulenberg, J., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (2000). "Spread your wings and fly": The course of health and well-being during the transition to young adulthood. In L. Crockett & R. Silbereisen (Eds.), *Negotiating adolescence in times of social change* (pp. 224-255). New York: Cambridge University Press.

Schulenberg, J., O'Malley, P. M., Bachman, J. G., Wadsworth, K. N., & Johnston, L. D. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol, 57*, 289-304.

Schulenberg, J., Wadsworth, K. N., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Adolescent risk factors for binge drinking during the transition to young adulthood: Variable- and pattern-centered approaches to change. *Developmental Psychology, 32*, 659-674.

Sewell, W. H., & Shah, V. P. (1968). Social class, parental encouragement, and educational aspirations. *American Journal of Sociology, 73*, 559-572.

Shaver, P., Furman, W., & Buhrmester, D. (1985). Transition to college: Network changes, social skills, and loneliness. In S. Duck (Ed.), *Understanding personal relationships: An interdisciplinary approach*. London: Sage.

Shedler, J., & Block, J. (1990). Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist, 45*, 612-630.

Sher, K. J. (1991). *Children of alcoholics: A critical appraisal of theory and research*. Chicago: University of Chicago Press.

Sher, K. J., Trull, T. J., Bartholow, B. D., & Vieth, A. (1999). Personality and alcoholism: Issues, methods, and etiological processes. In K. E. Leonard & H. T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (pp. 54-105). New York: Guilford Press.

Sher, K. J., Wood, P. K., & Gotham, H. J. (1996). The course of psychological distress in college: A prospective high-risk study. *Journal of College Student Development, 37*, 42-51.

Sherrod, L. R., Haggerty, R. J., & Featherman, D. L (1993). Introduction: Late adolescence and the transition to adulthood. *Journal of Research on Adolescence, 3*, 217-226.

Silbereisen, R. K., Eyferth, K., & Rudinger, G. (Eds.) (1986). *Development as action in context: Problem behavior and normal youth development*. New York: Springer-Verlag.

Silbereisen, R. K., & Kracke, B. (1997). Self-reported maturational timing and adaptation in adolescence. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 85-109). New York: Cambridge University Press.

Silbereisen, R. K., & Noack, P. (1986). On the constructive role of problem behavior in adolescence. In N. Bolger, A. Caspi, G. Downey, & E. M. Moorehouse (Eds.), *Persons in context: Developmental processes* (pp. 152-180). Cambridge, MA: Cambridge University.

Silverberg, S. B., & Gondoli, D. M. (1996). Autonomy in adolescence: A contextual perspective. In G. R. Adams, R. Montemayor, & T. Gullotta (Eds.), *Psychosocial development during adolescence* (pp. 12-61). Thousand Oaks, CA: Sage.

Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence: The impact of pubertal change and school context*. Hawthorne, NY: Aldine de Gruyter.

Smetana, J. (1988). Concepts of self and social convention: Adolescents' and parents' reasoning about hypothetical and actual family conflicts. In M. Gunnar (Ed.), *21st Minnesota symposium on child psychology* (pp. 79-122). Hillsdale, NJ: Lawrence Erlbaum.

Smith, G. T., Goldman, M. S., Greenbaum, P. E., & Christiansen, B. A. (1995). Expectancy for facilitation from drinking: The divergent paths of high-expectancy and low-expectancy adolescents. *Journal of Abnormal Psychology, 104*, 32-40.

Spear, L. P. (1998). *Adolescent period: Biological basis of vulnerability to develop alcoholism and other ethanol-mediated behaviors*.

Steinberg, L., & Silverberg, S. B. (1986). The vicissitudes of autonomy in early adolescence. *Child Development, 57*, 841-851.

Steinman, K. J. & Schulenberg, J. (June, 1999). *Alcohol use in adolescence: A developmental approach to understanding etiology and prevention.* Paper presented at the Seventh Annual Conference of the Society for Prevention Research, New Orleans, LA.

Straus, R. & Bacon, S. (1953). *Drinking in college.* New Haven: Yale University Press.

Sullivan, H. S. (1947). *Conceptions of modern psychiatry.* New York: Norton.

Sullivan, K., & Sullivan, A. (1980). Adolescent-parent separation. *Developmental Psychology, 16,* 93-99.

Susman, E. J., Dorn, L., Feagans, L. V., & Ray, W. J. (1992). Historical and theoretical perspectives on behavioral health in children and adolescents: An introduction. In E. J. Susman, L. V. Feagans, & W. J. Ray (Eds.), *Emotion, cognition, health, and development in children and adolescents* (pp. 1-8). Hillsdale, NJ: Lawrence Erlbaum.

Takahashi, K., & Majima, N. (1994). Transition from home to college dormitory: The role of preestablished affective relationships in adjustment to a new life. *Journal of Research on Adolescence, 4,* 367-384.

Tarter, R. E., & Vanyukov, M. (1994). Alcoholism: A developmental disorder. *Journal of Consulting and Clinical Psychology, 62,* 1096-1107.

Temple, M. T., Fillmore, K. M., Hartka, E., & Johnstone, B. M. (1991). A meta-analysis of change in marital and employment status as predictors of alcohol consumption on a typical occasion. *British Journal of Addiction, 86,* 1269-1281.

U.S. Congress, Office of Technology Assessment (1991). *Adolescent health-Volume 1: Summary and policy options.* Washington, DC: U.S. Government Printing Office.

Udry, J. R. (1987). Hormonal and social determinants of adolescent sexual initiation. In J. Bancroft & J. M. Reinisch (Eds.), *Adolescence and puberty.* New York: Oxford University Press.

Wachs, T. D. (2000). *Necessary but not sufficient: The respective roles of single and multiple influences on individual development.* Washington DC: American Psychological Association.

Wagenaar, A. C., Toomey, T. L., Murray, D. M., Short, B. J., Wolfson, M., & Jones-Webb, R. (1996). Sources of alcohol for underage drinkers. *Journal of Studies on Alcohol, 57,* 325-333.

Waterman, A. S. (1982). Identity development from adolescence to adulthood: An extension of theory to a review of research. *Developmental Psychology, 18,* 341-358.

Weber, M. D., Graham, J. W., Hansen, B., & Flay, B. R. (1989). Evidence for two paths of alcohol use onset in adolescents. *Addictive Behaviors, 14,* 399-408.

Wechsler, H., Dowdall, G. W., Maenner, G., Gledhill-Hoyt, J., & Lee, H. (1998). Changes in binge drinking and related problems among American college students between 1993 and 1997. *Journal of American College Health, 47*, 57-68.

Wills, T. A., & Hirky, A. E. (1996). Coping and substance abuse: A theoretical model and review of the evidence. In M. Zeidner (Ed.), *Handbook of coping: Theory, research, applications* (pp. 279-302). New York: John Wiley & Sons.

Wills, T. A., Pierce, J. P., & Evans, R. I. (1996). Large-scale environmental risk factors for substance use. *American Behavioral Scientist, 39*, 808-822.

Wilsnack, R. W., Wilsnack, S. C., and Klassen, A. (1984). Women's drinking and drinking problems: Patterns from a 1981 national survey. *American Journal of Public Health, 74*, 1231-1238.

Wilsnack, S. C . (1995). Alcohol use and alcohol problems in women. In A.L. Stanton (Ed.), *The psychology of women's health: Progress and challenges in research and application* (pp. 381-443). Washington, DC: American Psychological Association.

Windle, M. (1992). A longitudinal study of stress buffering for adolescent problem behaviors. *Developmental Psychology, 28*, 522-530.

Windle, M., & Barnes, G. M. (1988). Similarities and differences in correlates of alcohol consumption and problem behaviors among male and female adolescents. *International Journal of the Addictions, 23*, 707-728.

Windle, M., & Davies, P.T. (1999). Developmental theory and research. In K. E. Leonard & H. T. Blane (Eds.), *Psychological theories of drinking and alcoholism* (pp. 164-202). New York: Guilford Press.

Windle, M., & Searles, J. S. (Eds.) (1990). *Children of alcoholics: Critical perspectives*. New York: Guilford Press.

W. T. Grant (1988). *The forgotten half: Pathways to success for America's youth and young families*. Washington, D.C.: Youth and America's Future: The William T. Grant Commission on Work, Family, and Citizenship.

Youniss, J., & Yates, M. (1997). *Community service and social responsibility in youth*. Chicago: University of Chicago Press.

Zirkel, S. (1992). Developing independence in a life transition: Investing the self in the concerns of the day. *Journal of Personality and Social Psychology, 62*, 506-521.

Zucker, R. A. (1987). The four alcoholisms: A developmental account of the etiologic process. In P. C. Rivers (Ed.), *Nebraska Symposium on Motivation, 1987: Alcohol and addictive behavior* (pp. 27-83). Lincoln: University of Nebraska Press.

Zucker, R. A. (1989). Is risk of alcoholism predictable? A probabilistic approach to a developmental problem. *Drugs and Society, 3*, 69-93.

Zucker, R. A. (1994). Pathways to alcohol problems and alcoholism: A developmental account of the evidence for multiple alcoholisms and for contextual contributions to risk. In R. A. Zucker, J. Howard, & G. M. Boyd (Eds.), *The development of alcohol problems: Exploring the biopsychosocial matrix of risk* (pp. 255-289). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Zucker, R. A. (2000). Alcohol involvement over the life course. In National Institute on Alcohol Abuse and Alcoholism, *Tenth Special Report to the U.S. Congress on Alcohol and Health: Highlights from Current Research* (pp. 28-53). Washington, DC: U.S. Department of Health and Human Services.

Zucker, R. A., Fitzgerald, H. E., & Moses, H. D. (1995). Emergence of alcohol problems and the several alcoholisms: A developmental perspective on etiologic theory and life course trajectory. In D. Cicchetti (Ed.), *Developmental psychopathology, Vol. 2: Risk, disorder, and adaptation* (pp. 677-711). New York: John Wiley & Sons.

TABLES

Table 1. Conceptual Models Relating Developmental Transitions to Health Risks

Model Descriptions	Examples	Intervention Implications
Overload		
Multiple developmental transitions overwhelm coping capacities, resulting in increased health risk behaviors.	Use of alcohol use to attempt to cope with heightened stress caused by experiencing multiple transitions.	Stagger timing of major transitions; increase coping capacities.
Developmental Mismatch		
Developmental transitions alter the goodness-of-fit between individuals and their contexts, resulting in changes in health risk behaviors.	Transition decreases match between needs of individual and opportunities provided in context, resulting in seeking alternative contexts involving increased heavy drinking and other risky behaviors.	Increase match between individual needs and opportunities in context; provide better-matching alternative contexts.
Increased Heterogeneity		
Developmental transitions exacerbate individual differences in ongoing health/well-being trajectories.	Individuals already running an emotional/psychological deficit have difficulty negotiating new transition, resulting in increased alcohol use as a form of self-medication.	Through targeted efforts, counter individual deficits and social networks supportive of problem behaviors.
Transition Catalyst		
Health risk behaviors may assist in, or be fundamental parts of, negotiating certain developmental transitions.	Alcohol use increases because it is believed to facilitate new friendships, romantic/sexual relations, and social bonding.	Provide alternative routes to meeting social and sensation-seeking goals.
Heightened Vulnerability to Chance Events		
Developmental transitions can increase likelihood and effects of positive and negative chance events.	Increased exploratory behavior of new contexts contributes to novel experiences, including heavy drinking and associated negative effects.	Increase awareness of, and resiliency to, potential negative effects of chance events.

Table 2. Summary and Examples of Major Domains of Developmental Transitions

---

Fundamental Biological and Cognitive Changes

1. **Pubertal/physical development**
   - Hormonal changes, physical development, and societal expectations lead to increased interest in sexual relationships and alcohol use.
   - Adolescents begin to look like adults and may desire adult status and privileges.

2. **Cognitive and moral development**
   - Normative cognitive changes:
     - Increased ability to think abstractly.
     - View issues as relative rather than absolute.
     - Judgments based on higher-level universal principles, not "arbitrary" rules.
     - Alcohol expectancies: With age, more endorsement of benefits, less of risks.
   - Due in part to these cognitive developments, adolescents notice the hypocrisy of adults' blanket prohibitions against youthful alcohol use.
   - Therefore, harm reduction approaches should be seriously considered for college students with respect to alcohol use.

Identity Domain Transitions

- Through *exploration* of philosophies, lifestyles, relationships, and behaviors, adolescents eventually make *commitments* to an integrated set of personal beliefs, values, and goals.
- Such identity exploration is normative and healthy, but may increase experimentation with risky behaviors, including alcohol and other drug use.

Affiliation Domain Transitions

1. **Transformations in relationships with the family of origin**
   - Increasing autonomy and independence from parents, ideally in context of continued support and attachment.
   - *Quality* of relationship with parents may improve when adolescent moves out.
   - *Quantity* of interaction decreases: less opportunity for day-to-day parental influence.
   - Older siblings also influence alcohol expectancies and consumption.

2. **Transformations in relationships with peers**
   - Increased sensitivity to peer culture and influences during adolescence.
   - Direct and indirect influences:
     - Susceptibility to peer influences increases; may be greater during transitions.
     - Similarities between individuals and friends encourage continuity of behavior.
     - Cultural myths about campus drinking increase alcohol use/heavy drinking.
   - Note that peer influences are complex, multidimensional, and not monolithic.
   - Alcohol use is fundamental part of social relationships and sociability.

Table 2 (continued)

3. Romantic and sexual relationships

- Adolescents and young adults have an intense interest in romance and sex.
- However, they are relatively inexperienced, and may lack sophistication and skills they need to achieve mutually satisfying and safe sexual relationships.
  - 70% of 18-year-olds have engaged in sexual intercourse; 30% have not.
  - Majority of sexually "experienced" have had only one partner.
- Desire for sex/romance may lead to situations with alcohol (e.g., parties/bars).
- Alcohol use may make sexual situations more likely.
- Many unplanned sexual situations for which students may be poorly prepared.
- Transition to marriage associated with declining alcohol and other drug use.

Achievement Domain Transitions

1. School transitions

- Children and adolescents experience and adapt to a series of school transitions.
  - Trend towards more autonomy, less individualized instructor attention.
  - Great variability between schools.
- Benefits of postsecondary education are more than academic/occupational.
  - Postpone adult roles (worker, spouse, parent).
  - Pursue varied interests.
  - Experiment with lifestyles.
- Transition to college requires many significant adaptations in major domains of life.
- Time of growth for some, as well as vulnerability.
- Cultural norms promote a period of heavy drinking during undergraduate years.
- Desire to make friends, participate in college life, and cope with stress may all lead to increased alcohol use.

2. Work transitions

- Part-time work transitions during high school associated with more alcohol and other drug use.
  - Longer hours on the job (i.e., greater work intensity) associated with more substance use.
  - Causal connections between work intensity and substance use are unclear, with the association being due in part to "premature adulthood."
- Part-time work during college is common, but its effects on substance use may be muted due to other college influences on substance use.
- School to work transitions (post-college) associated with declining substance use.

Table 3. Program and Policy Implications Regarding College Drinking

Broader Developmental Intervention Implications

1. **Developmental transitions represent windows of opportunity for effecting change.**
   - From a developmental perspective, a primary goal of intervention is to change attitudes and behaviors that are already changing—that is, to ameliorate and redirect potentially risky trajectories.
   - Developmental transitions are sensitive periods for intervention; programmers can take advantage of these naturally occurring windows of disequilibrium, to promote healthy patterns before unhealthy ones are established.

2. **Facilitate developmental transitions.**
   - To the extent that difficulties with some of these transitions contribute to increased substance use, then efforts to assist in negotiating these transitions should translate into less substance use.
   - Institutions and students should seek to match varied available programs with individual needs.
   - Challenge for institutions is to provide for students' important needs while satisfying their desires.

3. **Intervene at levels of individual, context, and individual/context match.**
   - Comprehensive interventions to effect individual change should be conducted at individual and context levels, and should include attempts to improve match between individuals and their contexts.
   - Successful adaptation to contextual demands of college should increase ability to avoid behaviors that are harmful to health.

4. **Content and level of interventions should be developmentally appropriate.**
   - Interventions with college students need to take into account what is known about normative developmental changes and concerns of this population.
   - An upward extension of programs and policies that were effective for younger adolescents may not prove effective for college students.
   - Students should be active participants or consultants in the development of programs and policies.

5. **Balance increased freedom with increased responsibilities.**
   - The balance between freedoms and responsibilities is crucial, in that too much of one relative to the other can thwart the progression toward increased mastery.
   - For many, the transition to college is associated with an imbalance between increased personal freedoms and social responsibilities, and this imbalance may contribute to increased heavy drinking.
   - Possible solutions include slowing down the pace of increased freedoms during the transition, and increasing personal and social responsibility.

Alcohol-Specific Programming Implications

1. **Reduce negative consequences of heavy drinking.**
   - In recognizing how embedded heavy drinking is in the college experience, quick changes in the national binge drinking rates are unlikely.
   - An adaptive strategy in negotiating the transition to college is to explore one's new contexts as well as one's identity in relation to the new contexts, increasing the odds of unpredicted events.
   - This strategy underscores importance of harm reduction strategies for college students.

Table 3 (continued)

2. **Target interventions according to likely course of heavy drinking.**
   - Adolescents with extensive prior alcohol and other drug use histories may be at risk for adjustment difficulties in general, and may benefit from more focused intervention/treatment efforts.
   - In contrast, for those young people who are on an "experimental trajectory" with heavy drinking and other substance use, college adjustment problems may be neither a source nor consequence of their substance use, and intensive personal interventions might prove counterproductive.

FIGURES

Figure 1: Mean Score for 5+ Drinks in a Row in Past 2 Weeks by 4-year College Student Status

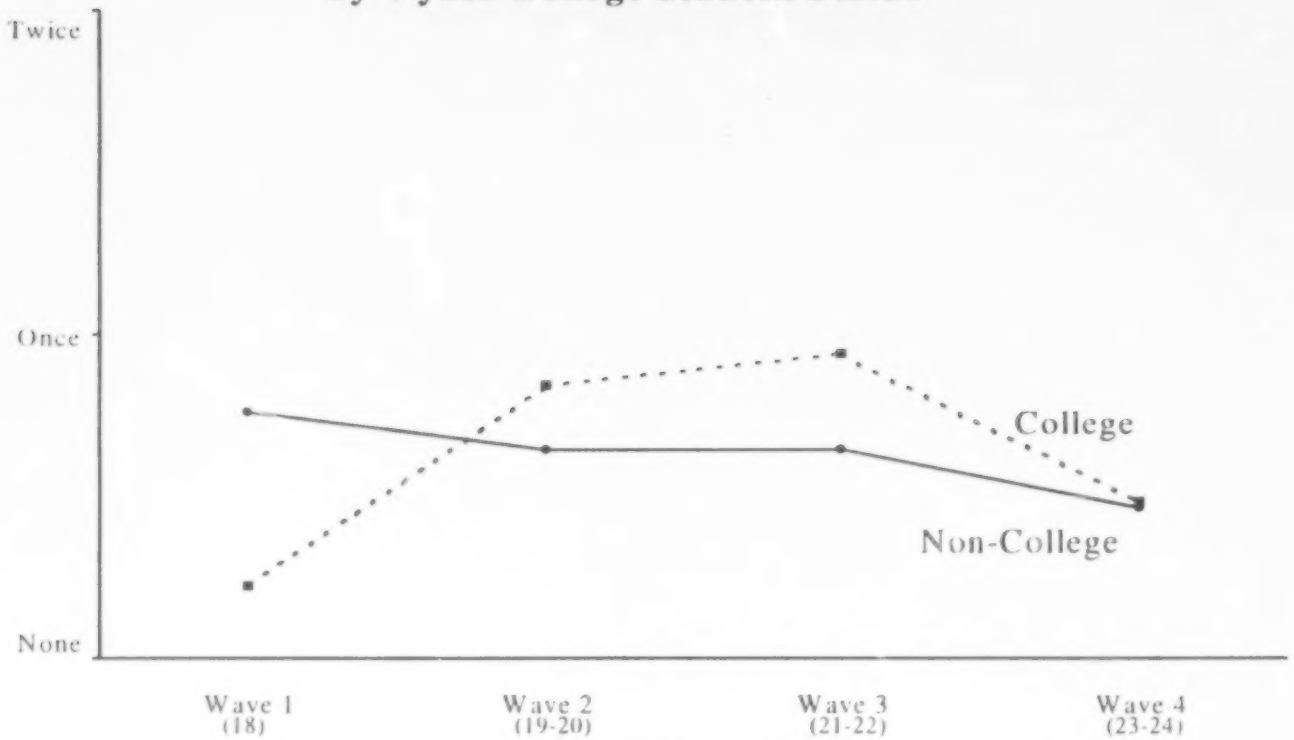
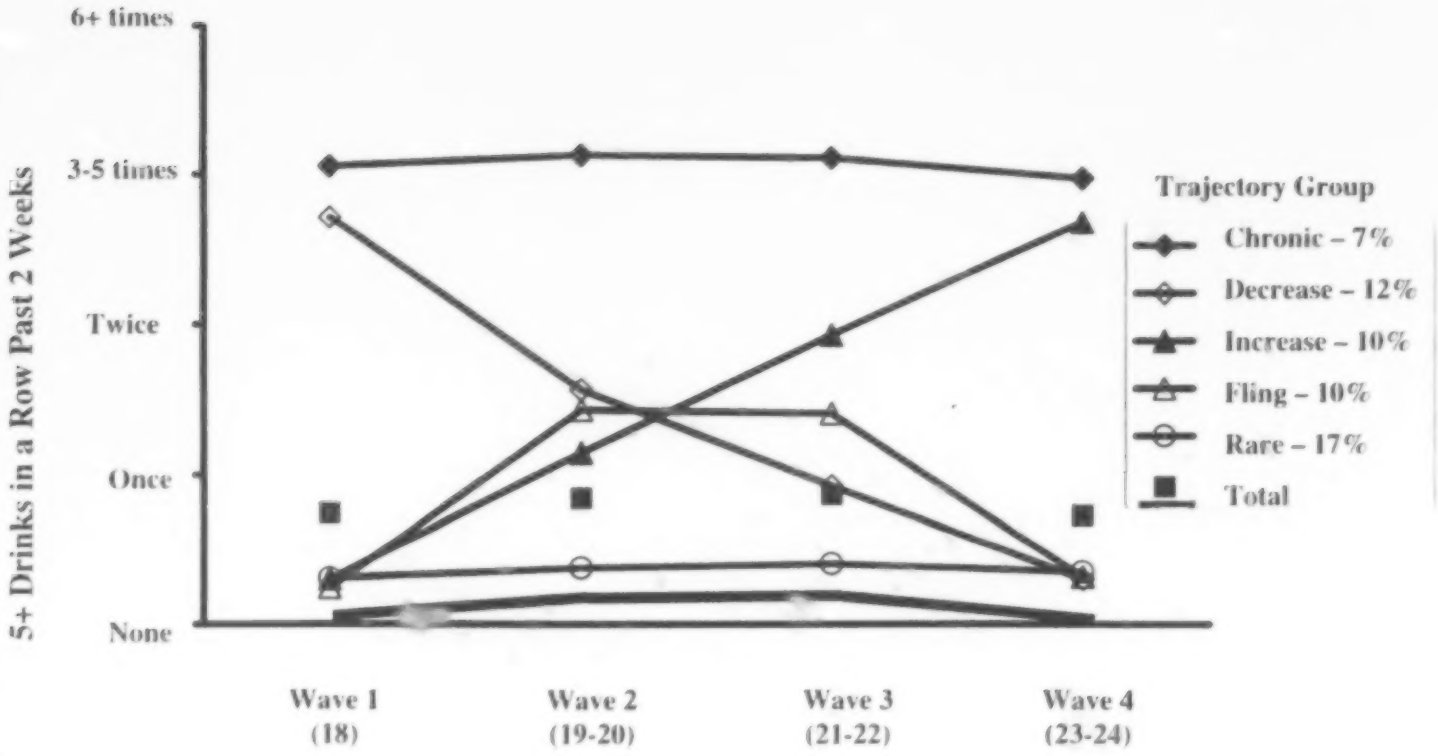


Figure 2: Mean Score for 5+ Drinks in a Row in Past 2 Weeks By Frequent Heavy Drinking Trajectory Group



ISR

SURVEY RESEARCH CENTER
INSTITUTE FOR SOCIAL RESEARCH
THE UNIVERSITY OF MICHIGAN